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VOLUME 217 AUGUST 26, 1937 NUMBER 9

ACUTE HEART FAILURE

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ACUTE heart failure is almost invariably a result of some chronic abnormality of function or structure. Cardiac disease runs progressively through a number of stages which merge into each other. This progress is more or less gradual, but the change may be greatly hastened and acute heart failure induced by some aggravating cause such as infection of the respiratory tract, cough, pregnancy, obesity, marked anemia, tachycardia, disturbances of rhythm or emotional and mental strain. Excessive exertion frequently brings about the signs of acute heart failure in persons previously free of symptoms.

PATHOLOGY

Theories in Connection with Altered Physiology

The exact mechanism by which the heart fails and by which the symptoms and signs are produced is explained on the basis of two major theories. In 1842 James Hope stated: "So long as the left ventricle is capable of propelling its contents, the corresponding auricle, being protected by its valve, remains secure, . . . but when the distending pressure of the blood preponderates over the power of the ventricle itself, its content, from not being duly expelled, constitutes an obstacle to the transmission of the auricular blood. Hence, the auricle becomes overdistended and the obstruction may be propagated backward through the lungs to the right side of the heart, and there occasion the same series of phenomena." This is a clear expression of the theory of back-pressure failure. This idea was not seriously controverted until Sir James Mackenzie in 1925 argued that the signs of congestive heart failure are due to a diminution in the amount of blood pumped by the heart, in turn causing an inadequate blood supply to the tissues.

The back-pressure theory is consistent with certain phenomena which can usually be demonstrated clinically or have been proved in the laboratory (Harrison). These are: the occurrence of congestive failure independently in the systemic and in the pulmonic circuits; the presence of dilatation of the heart whenever there is congestive heart failure; increase in the volume of blood in the lungs, with decrease in the volume of blood flow as a result of left ventricular failure; elevation of the venous pressure from failure of the right ventricle; increase in the total volume of circulating blood from failure of both ventricles. The back-pressure hypothesis, with its delayed circulation at the periphery, venous stasis and decreased rate of flow through the capillaries, satisfactorily accounts for cyanosis.

Experiments by Starling and Visscher and by Hemmingway and Fee indicate that the amount of oxygen used by the heart is more dependent upon the degree of dilatation than upon the actual work performed. Heart failure produced in animals by means of the administration of chloroform or of potassium chloride (Harrison, Friedman and Resnik) has shown that the essential change in the heart is dilatation, which may occur in either side independently. It has also been found that hypertrophy is probably preceded by dilatation, which is the immediate response to overwork, but that as actual increase in the thickness and power of the fibers occurs, dilatation is no longer present. However, after a certain degree of hypertrophy has taken place no further increase in size can occur without additional dilatation, which becomes permanent and progressive.

Evans and Matsuoka have shown that for a given minute volume there is greater oxygen consumption of the heart per beat, but less per minute, at slow than at fast pulse rates. Thus, tachycardia increases the need for oxygen and also brings about interference with the blood supply to the muscle of the left ventricle which takes place during diastole. Since small animals have very rapid heart rates while large animals have slow rates, it seems obvious that the recovery process takes place more quickly in small hearts than in large ones. This matter has been studied quite extensively by

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Hill, by Krogh and by Harrison, Ashman and Larsen, whose experiments, conducted by dissimilar methods, have shown that large muscle fibers require a longer period of oxygen diffusion than do small ones. Hypertrophied heart muscle may not be able to carry on an efficient circulation except at a comparatively slow rate. The vicious cycle whereby overwork brings about temporary dilatation, followed by hypertrophy and then the need for a slow rate with the tendency to dilate further under conditions of strain, is frequently seen in human beings.

The signs and symptoms of acute congestive heart failure, as well as the experimental evidence, seem more adequately and constantly to support the back-pressure theory than that of forward failure, but the frequent existence of some degree of forward failure is not denied. Dilatation of the left ventricle is not invariably demonstrated at autopsy in the case of patients having congestion and edema of the lungs. It can hardly be denied that in mitral disease and pulmonary obstruction there is back pressure producing right-sided strain; on the other hand, in aortic valve disease, hypertension and hyperthyroidism there may be forward failure, but even in these conditions there must be back pressure when the left ventricle has dilated and weakened.

Causes of Physiologic and Structural Pathology Leading to Heart Failure

CONTUSIONS

The thoracic cage does not afford perfect protection to the heart, which, lying against the sternum anteriorly, is exposed to impact there and is liable to compression when force is applied to the chest. Contusions of the myocardium may present clinical manifestations similar to those of infarction.

STRAIN

The direct effects on the heart vary with the kind and degree of strain and the previous conditions of the organ. Heart strain may be intrinsic or extrinsic in origin (White). Combinations of valvular lesions and disorders of the rhythm may result in heart failure while either alone might not seriously effect the circulation.

Intrinsic Factors. Mitral Lesions. Mitral insufficiency with regurgitation of blood produces strain on both sides of the heart. The left ventricle must increase its muscle mass in order to take care of the work of pumping blood in two directions. The left auricle feels the effect of the back pressure, which causes it to undergo hypertrophy; the right auricle is not immediately affected, but may dilate as a result of failure of the other chambers. Mitral stenosis brings about permanent strain on the left auricle and right ventricle; both become hypertrophied and frequently fail, while the left ventricle often remains unaffected. The pulmonary blood vessels become congested, with decreased oxygenation of the blood sufficient to produce cyanosis. The congestion in the pulmonary circulation may bring about extravasation of blood into the parenchyma of the lungs.

Aortic Valve Disease. Lesions of the aortic valve bring about strain on the left ventricle without affecting the other chambers of the heart until the left ventricle fails. The left ventricular strain results in hypertrophy of that chamber and eventual failure, the first sign of which is usually dyspnea with or without pulmonary edema.

Tricuspid Valve Disease. Disease of the tricuspid valve, which rarely occurs, brings about strain on the right side of the heart in a fashion similar to mitral disease on the left side.

Pulmonary Valve Disease. Congenital pulmonary stenosis of marked degree brings about great strain on the right ventricle with the production of enlargement and failure.

Congenital Defects. With congenital defects the production of right or left-sided strain follows the same physiologic principles as in acquired valvular lesions.

Diseases of the Pericardium. These vary from local infection to an extensive general inflammatory process with the production of a large effusion sufficient to embarrass the heart because of pressure. If the heart becomes adherent to the surrounding structures it is placed under great strain with resultant hypertrophy, especially of the left ventricle, which may suffer acute failure.

Disturbances of Mechanism. Auricular flutter and fibrillation produce strain more than do disturbances of the rate without change in the rhythm, except in the case of ventricular tachycardia. Heart block does not increase the strain of the heart except in reducing the coronary circulation if the ventricular rate becomes very slow.

Extrinsic Factors. Hypertension. The most important extrinsic factor is hypertension. Coincident coronary artery disease and kidney disease may hasten the event, but the strain of hypertension alone is sufficient to produce acute left ventricular failure. If compensation becomes reestablished the cardiac output and the velocity of blood flow never return to normal.

Hyperthyroidism. Heart strain may be induced by the tachycardia of hyperthyroidism, but there is little if any actual toxic myocarditis.

Emphysema and Pulmonary Disease. There is strain on the right ventricle in the early stage of emphysema, when there is increased blood flow to the right heart on account of negative intra-

pleural pressure. The great majority of patients with bronchial asthma have shown no pronounced lesions of the heart at autopsy. Pulmonary tuberculosis places no direct strain upon the heart, although atrophy of the cardiac muscle sometimes occurs in chronic cases.

Arterial Embolism. A high degree of occlusion of the pulmonary artery may bring about sudden dilatation of the right ventricle with the signs and symptoms of shock and right ventricular failure. This acute, cor pulmonale has recently been described by White. Embolism in any artery large enough to cut off a considerable portion of the arterial tree may so obstruct the systemic circulation as to greatly increase heart strain. Embolism of a large vessel usually produces death as a result of peripheral circulatory failure, but when such an embolism occurs in a patient with heart disease the signs of acute congestive failure may occur.

Sclerosis of the Pulmonary Artery. Some degree of sclerosis of the pulmonary artery, which when widespread is known as Ayerza's disease, is not a rare condition. The type of acute heart failure which results from marked pulmonary sclerosis is that produced by strain on the right ventricle.

Exercise. Exercise and work do not bring about harmful strain in a normal heart, but physical exercise may precipitate failure in hearts already diseased. On account of diminished coronary blood flow, older hearts do not stand the strain of strenuous physical exercise so well as normal hearts in young people.

Obesity. In addition to the mechanical burden of increased weight there probably are, in the obese, extra areas of capillary vessels through which blood must flow, producing an increase in the work of the heart. Fatty infiltration of the heart, not to be confused with fatty degeneration, is a very common finding at the autopsies of obese persons, and while it is difficult or impossible to be certain of such a diagnosis in the living, it seems probable that this diagnosis, formerly a common one, is often correct.

Miscellaneous Extrinsic Factors. High altitudes affect the heart only by reducing the oxygen content in the air. In normal hearts an altitude below ten thousand feet imposes little strain. Anesthesia and surgical operations produce little strain on the heart, but vary considerably in their effect on the nervous control of the cardiocirculatory apparatus. The ingestion of great quantities of fluids produces heart strain. Alcohol, coffee, tea and tobacco sometimes cause disturbances of the cardiac rhythm and occasionally precipitate angina pectoris, but produce no direct strain on the myocardium. The pregnant woman is prone to have some shortness of breath and palpitation from the mechanical effects of the pressure of the uterus upward against the diaphragm, and even some edema from interference with the venous return from the extremities. The work of the heart is increased somewhat because an extra flow of blood is required by the growing fetus through the arteriovenous communication to the placenta. It is not uncommon to have the first evidence of cardiac failure appear during pregnancy. Postural hypotension in patients who have marked changes in arterial blood pressure upon change in posture may bring about symptoms of failure.

MYXEDEMA

The original American report of myxedematous heart was made in 1927 by Fahr, who concluded that the name is justified because the heart failure due to myxedema can be completely alleviated only by treatment with thyroid extract. The signs and symptoms are those of both right and left ventricular failure, with diffuse cardiac enlargement. Occasionally there is a myxedematous pericardial effusion. Acute heart failure is experienced in myxedema as the result of some unusual strain.

DISEASES OF THE MYOCARDIUM, INCLUDING INFARCTION

Diphtheria, Scarlet Fever and Other Infectious Diseases. The heart damage in diphtheria is almost always preceded by paralysis of the throat. Disturbances of the rhythm and rate occur owing to various degrees of heart block. In scarlet fever and other infectious diseases, myocarditis is rare. The characteristic heart damage is benign endocarditis, which occurs in about 0.1 per cent of the patients. Rheumatic myocarditis rarely causes heart failure in the absence of valvular disease.

Rupture of Papillary Muscle. The infarction subsequent to coronary occlusion may cause rupture of a papillary muscle, and death.

Periarteritis Nodosa. Periarteritis nodosa is a rare cause of death from myocardial failure.

Calcification. Calcification occurs not only in the pericardium and endocardium, especially in the aortic and mitral valves, and in the coronary arteries, but once in a great while in a rather large area of the myocardium as the result of an old infarction. Still more rarely a calcium deposit occurs in the presence of normal coronary arteries, and in such pattern as to make it seem unlikely that it is the result of myocardial infarction.

Coronary Sclerosis and Occlusion. With gradual diminution in the coronary flow brought about by sclerosis of the coronary vessels, there is a stretching of the heart muscle, followed by hypertrophy and eventually by failure, more often of the left ventricle. Marked insufficiency of the coronary circulation due to sclerosis may bring about acute heart failure and even sudden death without any evidence at autopsy of coronary artery

occlusion. The clinical picture of acute coronary occlusion is too well known to require repetition here. Occasionally, marked changes in the rate and rhythm of the heart occur, owing to interference with the blood supply of the conducting tissues. Complete heart block with Adams-Stokes seizures is sometimes the immediate result of acute coronary thrombosis. Obstruction of the coronary arteries usually results from one of the following causes: (1) a thrombus originating in a coronary artery which shows evidence of previous arteriosclerosis; (2) sclerosis and calcification without thrombosis; (3) narrowing of the coronary artery due to syphilitic aortitis; (4) an embolus originating within the heart.

Syphilis. Acute heart failure secondary to syphilitic aortic insufficiency is not uncommon; whether syphilis of the heart muscle may occur independently of syphilis of the aorta is a matter of opinion. Norris, in a very recent paper, states his belief that "every patient with aortic syphilis will also be found to have myocardial syphilis," and that the latter is often confused with hypertensive arteriosclerotic and rheumatic heart maladies. Sudden death due to encroachment by the process of syphilitic aortitis on the orifices of one or both coronary arteries is a form of myocardial failure which is not unknown.

NUTRITIONAL DISTURBANCES

Severe anemia of any type directly affects the nutrition of the myocardium, thereby affecting its efficiency. Deficiency diseases, especially beriberi and scurvy, have a similar effect. In a well-developed case of the cardiac type of beriberi, the symptoms are those of congestive heart failure, sometimes acute.

Structural Pathology

There is no structural pathology characteristic of acute heart failure. Rarely a normal heart may fail if it is under sufficient strain; in such cases there is no sign of degeneration or inflammation in the myocardium, as is illustrated by the hypertrophied but otherwise healthy left ventricle in a heart that has failed as a result of essential hypertension. Another example is the hypertrophied but healthy right ventricular muscle in a heart that has failed from marked mitral stenosis. The most common structural abnormality found with acute congestive heart failure is cardiac enlargement, including both hypertrophy and dilatation. When the failure has been sudden, dilatation alone is sometimes found.

Acute myocardial failure is occasionally produced by an uncommon pathologic process such as amyloidosis, multiple abscesses, generalized suppurative myocarditis, metastatic carcinoma and marked fatty infiltration.

DIAGNOSIS

Signs and Symptoms

LEFT VENTRICULAR FAILURE

When failure of the left ventricle occurs without failure of the right ventricle, there is always diminution in vital capacity, dyspnea of varying degrees, accentuation of the pulmonic second sound and increase in the roentgen shadows of the hilus blood vessels. Two characteristic signs are diastolic gallop rhythm and pulsus alternans.

The importance of diastolic gallop rhythm lies in its prognostic significance. In a group of fifty patients with various types of heart disease in whom the abnormal gallop developed while under observation the average duration of life after detection of this sign was twenty-one months. Patients who had congestive failure at the time gallop rhythm was first detected lived about one half as long as those who developed it without congestive failure. Thompson and Levine found that a diastolic gallop in patients under forty years of age was particularly serious. Gallop rhythm sometimes disappears as a result of treatment, but it invariably reappears and its disappearance does not appreciably affect the prognosis.

Pulsus alternans is a prognostic sign of slightly less significance than diastolic gallop rhythm. The average duration of life in a series of eighty patients who showed this sign was twenty-seven months after its detection. As with diastolic gallop rhythm, the younger the patient the worse the prognosis. Pulsus alternans appearing soon after acute coronary occlusion implies a particularly serious outlook.

A third important feature of left ventricular failure is cardiac asthma, which usually comes on at night unexpectedly and is of relatively short duration. The pulmonic second sound becomes greatly accentuated, so that even in the presence of marked hypertension it is louder than the aortic second sound. The heart is usually rapid without change in rhythm. The arterial blood pressure usually becomes moderately elevated. In a few cases there is precordial pain.

The first symptom of left ventricular failure is dyspnea upon exertion. The factor of pulmonary vessel engorgement determines the presence of abnormal physical signs in the chest. In very early left ventricular failure the engorgement may not be sufficient to produce dulness upon percussion over the lung bases in the posterior chest. As backing up of blood increases within the blood vessels which surround the alveoli, dulness upon percussion appears as well as change in the respiratory sounds. Rales are not present until blood serum escapes from the blood vessels into the alveoli.

When serum escapes suddenly and profusely the syndrome of acute pulmonary edema occurs with pink frothy sputum; this in many cases is due to an immediately preceding heart strain, but in the numerous cases which occur at night there must be other factors. An important sign of what Moschcowitz calls "hypertension of the lesser circulation" is accentuation of the second pulmonic sound. Even in hypertensive patients, failure of the left ventricle causes the pulmonic second sound to become louder than the aortic second sound.

The cyanosis which is the result of extreme left ventricular failure is grayish. Frequently the hands are warm, indicating that blood flow in the periphery is not notably retarded; such a combination strongly suggests the pulmonary origin of the cyanosis.

Periodic breathing of the Cheyne-Stokes variety is often coincident with left ventricular weakness, and becomes more pronounced as failure progresses. Its occurrence only during sleep is not particularly significant in an elderly patient, but in a young person it signifies an important degree of failure.

The level of the arterial blood pressure is usually maintained until extreme myocardial weakness occurs. During attacks of pulmonary edema the pressure may rise, probably owing to cerebral anoxemia. The drop which often accompanies coronary artery thrombosis is probably not due to left ventricular failure but to shock.

The uncomplicated signs and symptoms of left ventricular failure may be present for years. Sometimes the onset of right heart failure, with swelling of the liver and feet, seems to relieve the tension of the pulmonary circuit, with diminution in dyspnea. Tachycardia usually accompanies failure of either ventricle.

RIGHT VENTRICULAR FAILURE

Distention of the veins is an obvious result of right ventricular failure, which is always accompanied by increase in venous pressure and usually by engorgement of the liver. Swelling of the veins of the neck can be observed to accompany manual compression of an acutely engorged liver. Dyspnea in right ventricular failure, with an efficient left ventricle, is slight or absent unless the failure is secondary to chronic pulmonary lesions. The respiratory center in such patients is less irritable than normally, which tends to prevent dyspnea, while the oxygen lack sometimes induces a state of somnolence akin to stupor.

The cyanosis of right ventricular failure is parallel to the degree of venous congestion, and varies in color from the cherry of early mitral stenosis to the purple of acute pulmonary embolism.

The presence of high venous pressure in acute right ventricular failure leads to edema and serous effusions, sometimes reaching tremendous proportions. A secondary factor is deficiency of plasma protein.

Differential Diagnosis

Acute heart failure is infrequently mistaken for another syndrome. The primary distinction is between failure of cardiac and of peripheral origin. Peripheral circulatory failure, or shock, occurs when there is an acute disparity between the blood volume and the functional capacity of the vascular bed. The symptoms of shock, which may be medical as well as surgical (traumatic or postoperative), include prostration, coldness, feeble rapid pulse, poor heart sounds, low blood pressure, pallor, anemia and anxious facies. The cardinal signs and symptoms of acute heart failure are absent, namely dyspnea and orthopnea in left ventricular failure, and engorgement of the veins and venous circuit in right ventricular failure. Cardiac failure and peripheral circulatory failure sometimes occur in combination. The carotid sinus reflex, with its symptoms of dizziness, fainting and falling blood pressure, which occurs in susceptible individuals from pressure on the sinus, is sometimes mistaken for acute heart failure, especially when there is concomitant heart disease.

Prognosis

Acute heart failure carries with it an extremely grave prognosis. Complete recovery from the condition is practically unknown, and response to treatment, while often striking, is only temporary. The average duration of life after the onset of congestive cardiac failure has been found to be from six months to two years. Exceptions are the cases of functional origin, for example, the heart failure of myxedema and beriberi, both of which are completely and permanently eradicated by proper treatment.

Prognosis in an individual patient can be made rather accurately on the basis of the degree and the rate of progress of the disease. Progress is influenced by ability to follow instructions, as well as by the response to therapy. Certain patients are refractory to digitalis and other drugs while others seem to be especially benefited. When acute failure is precipitated by some such factor as pregnancy or a respiratory infection, the prognosis is not so serious as when it develops as a result of gradual weakening of the myocardium.

The larger the heart the poorer the prognosis, with rare exceptions. The prognostic significance of gallop rhythm and that of pulsus alternans have been considered in another section.

Treatment

Physiology of Therapeutic Measures

It has been demonstrated by Cohn and Stewart that beneficial saturation of the heart muscle by digitalis is accompanied by a diminution of the heart size. Decreasing the size of the heart in the presence of high venous pressure sometimes brings about an increase in the cardiac output. A similar decrease in heart size, with benefit to the patient, has been shown to follow venesection. Rest, the administration of sedatives and narcotics, and venesection decrease the demands on the heart. Digitalis, quinidine and probably other drugs such as the diuretics increase the efficiency of the heart by slowing the rate, doing away with pulse deficit and improving the power of contraction.

Digitalis

The marked slowing of ventricular rates produced by digitalis in cases of auricular fibrillation has tended to give the impression that patients with regular rhythm are not benefited by the drug because slowing of the heart is then usually slight; but when the manifestations of myocardial failure are present the patient will usually derive some benefit from it. Seizures of paroxysmal, nocturnal dyspnea may be abolished or made less severe.

Another indication is the presence of gallop rhythm even in the absence of other signs of failure. Whenever a patient has required digitalis its use should be continued.

The dose of digitalis is the amount required to produce the complete physiologic effect without the production of toxic symptoms; this will approximate 1.5 gr. (1 cat unit) for each 10 lb. of body weight, which should be given over a period of twenty-four to seventy-two hours. This should be followed by a daily ration of 1.5 to 3 gr. depending on the size of the heart.

There is considerable variation in the susceptibility of patients to the drug. I have never seen a person who had a true idiosyncrasy, although I have seen those who thought they could not tolerate it. Occasionally patients will absorb a liquid preparation more completely than powdered leaf. In the presence of marked congestive failure with engorgement of the liver and considerable edema, digitalis by mouth may give poor results, whereas its subcutaneous, intramuscular or intravenous administration will be of value.

There are few contraindications to the use of digitalis. It should be temporarily omitted when toxic symptoms occur, such as nausea and vomiting or the onset of bigeminal rhythm. The latter in patients who have had no digitalis does not contraindicate its use. Partial heart block may be made worse by digitalis, but even in such patients congestive failure calls for the drug. Shock is a definite contraindication unless there are also manifestations of congestive failure. Immediately following coronary occlusion digitalis is of no value, but it should not be withheld if evidence of congestive failure appears.

Diuretics

Diuretics, often indispensable in the treatment of advanced heart disease, are rarely of service in combating acute heart failure. Paroxysms of cardiac asthma sometimes are rendered less frequent by daily rations of one of the theobromin compounds.

Mechanical Measures

Paracentesis of the abdomen or thorax is seldom required in acute heart failure, but phlebotomy is a valuable procedure. In general it may be said that if the liver is congested, the veins of the neck distended, and cyanosis present, the removal of 400 to 700 cc. of blood is often helpful and sometimes lifesaving. The production of venestasis by bandaging the extremities or by inflating the cuffs of ordinary sphygmomanometers placed around the extremities is of little value in cardiac failure in general. This method may be used with benefit during an attack of acute left ventricular failure (cardiac asthma) in order to diminish the degree of pulmonary congestion.

Oxygen Therapy

Oxygen therapy is often of great value, since it not only adds to the patient's comfort but frequently tides over a period which might otherwise result in complete disaster. With its onset the heart rate often becomes slowed. The rapid ventricular rate of acute congestive failure and auricular fibrillation which has progressed in spite of digitalization is retarded, with great improvement in the circulation, when the patient is placed within an oxygen tent. Pain following acute coronary thrombosis is usually diminished by the administration of oxygen. It may be efficiently supplied to the patient through a nasal tube, the end of which rests within the oropharynx. For those patients with acute heart failure in whom the nasal tube produces considerable discomfort, the method of choice is the modern oxygen tent, or open box, with its efficient cooling system and devices to maintain the desired oxygen atmosphere. An atmosphere of about 50 per cent oxygen is usually satisfactory, but as high as 90 per cent should be used if cyanosis is not relieved with less.

Other Drugs

The most useful drug other than digitalis is morphine. Severe attacks of cardiac asthma are usually relieved by morphine, which seems to depress the sensitivity of the respiratory center and

diminish the ventilation, with resultant decrease of the venous inflow and reduction of pulmonary congestion. The control of pain by morphine in patients with acute heart failure following coronary thrombosis is important since pain seems to be a factor in the production of peripheral circulatory failure. Patients with acute failure seldom require morphine for its hypnotic effect, which is better obtained by nonnarcotic drugs. Codeine is preferable to morphine for the control of cough.

Drugs which aid sleep are important in the treatment of acute heart failure. The mildest sedative that is effective is preferable. Usually a dose of phenobarbital, bromide, chloral hydrate or a similar hypnotic will prove satisfactory. Theophylline sometimes is useful in the prevention of nocturnal dyspnea. Epinephrine, used for the relief of cardiac asthma and pulmonary edema, should be injected subcutaneously, the average dose being 1 cc. of the 1:1000 solution (1/60 gr.). This drug should be avoided in angina pectoris, coronary thrombosis and aneurysm.

There are numerous other drugs which are useful in one way or another but which have no direct effect upon the circulatory apparatus. Among the proprietary preparations recommended for the treatment of acute heart failure there are none, so far as I am aware, which have any direct action upon the heart itself. Some of them, such as coramine, seem to have stimulating effects upon the respiratory center and possibly a vasoconstricting effect which may be useful in the treatment of peripheral circulatory failure. Caffeine sodium benzoate does apparently have a slight direct stimulating effect on the myocardium, and is often used as an emergency measure. Strophanthin, as an emergency measure, has no superiority over a suitable intravenous dose of digitalis. Glucose, of doubtful value in the treatment of acute failure, is based upon the idea of supplying nutrition to the heart.

Diet

During acute congestive failure the digestive mechanism should be spared as much as possible. For a few days a diet consisting of liquids only, including milk, should be restricted to the smallest amount which will satisfy the thirst and keep the tongue moist. After a few days a soft solid diet may be given, but without meat, fish, eggs or added salt. Later, as improvement takes place, the ordinary well-balanced diet may be given, limiting the protein if there is an appreciable degree of nephritis with nitrogen retention. Vitamins and minerals should be included in the form of fruit juices, leafy vegetables and milk. Rich, highly seasoned foods are irritating and stimulating. In the obese the diet should be as free as possible from fat.

General Management

After relief of acute failure every effort must be made to prevent its return. Apart from the use of drugs, this is attempted by restricting the activity to a level which does not produce dyspnea and palpitation. For the most part what the patient does is not so important as how he does it. Such a patient might be able to climb to the top of Bunker Hill Monument provided he took sufficient time. Certain things, such as lifting heavy weights, cannot be done in an easy fashion and must be avoided. Mild infections must be treated as if they were severe. Sufficient sleep must be ensured. Exposure to cold and moisture must be avoided. The winter months should preferably be spent in a warm climate.

Surgical methods such as total removal of the thyroid gland have no place in the treatment of acute cardiac failure, and should be restricted to well-proved cases of chronic cardiac invalidism.

Prevention

The most successful method of preventing or postponing acute heart failure is to prevent the occurrence, to reduce the severity, or to shorten the duration of the conditions leading to heart disease. In general terms this means the prevention of hypertension and vascular disease, of rheumatic fever in all its forms and of syphilis.

In many laboratories and clinics work is being directed toward a solution of the problem of the exact physiology of muscle fatigue, in the hope that reversible changes may be found to underlie heart failure. Until specific measures are available we must depend upon the prevention of precardiac diseases, long and carefully controlled convalescence from rheumatic disease, the prevention of paroxysmal rapid heart action by drugs such as quinidine sulfate, the proper use of drugs such as digitalis, general measures aimed at increasing the resistance of the body to infection and the rules of conduct which tend to diminish the rate of wear and tear in the cardiovascular system.

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A DEFINITION OF THE PRACTICE OF MEDICINE

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IF one suggests the introduction of a definition of the practice of medicine into the statute regulating the practice of medicine in Massachusetts, one is met by the question, What need is there for such definition? Who needs it? For the need is not obvious. Everybody knows what is meant, and if you try to define it you are bound to fail by putting in something that ought to be left out, or by leaving out something that ought to be put in. By way of reply to this questioning, let us consider who needs a definition of the practice of medicine.

In Massachusetts it is unlawful for the chiropractor to practice chiropractic. Is it? Who said so? Certainly not the statute, and if the chiropractors say that they are not practicing medicine, Who shall contradict them? A chief justice of the Supreme Court of Massachusetts did so some years ago, and that helps somewhat, but convictions of chiropractors for violation of the law are not frequent in Massachusetts. Chiropractors advertise in telephone directories and elsewhere in the Commonwealth, and they tell legislative committees that they will continue to practice without authorization. What is done about it? Are they not practicing medicine by giving spinal manipulation? One has only to read their advertising to realize how ridiculous are their claims that they do not practice medicine. Is not the osteopathist practicing medicine when he gives his treatments even if he does not "sever or penetrate the tissues of human beings"? The reason why chiropractors are convicted so rarely is because they claim that they are not practicing medicine. Patients of the chiropractor or friends of patients are frequently on the jury, and in the absence of an adequate definition of the practice of medicine, the prosecutor needs the eloquence of Demosthenes and Cicero combined to obtain a conviction.

Why does not everyone need a statutory definition of the practice of medicine? Certain persons are registered as duly qualified to do a certain thing. Persons not registered are forbidden to do this thing. Yet the statute does not set forth what the thing is. Does not every physician have a right to demand of the law what it is that he is permitted to do? Does not every citizen have the right to demand that the State protect him by specifying what the duly licensed person may do and

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what the unlicensed person shall not legally do? Yet the Massachusetts statute throws no light on this important matter. Perhaps this is one reason why unlicensed practitioners flourish here.

It would seem logical to introduce into the statute governing or regulating the practice of medicine some definition of what it is that the law is trying to regulate, that is, what, for the purpose of the statute, should be regarded as the practice of medicine. It is indeed logical, but that is not the way in which statutes are always drawn.

Reviewing the medical practice acts of the United States, including Alaska, the Canal Zone, Hawaii, the Philippine Islands and Puerto Rico, one finds a frank definition of the practice of medicine except in Alabama, California, Washington and Massachusetts. Alabama offers little: "Section 2837. An applicant for a certificate of qualification to treat diseases of human beings by any system of treatment whatsoever . . ."; and "Section 5191. Any person who treats or offers to treat diseases of human beings by any system of treatment whatsoever. . . ."

In California the nearest approach to a definition is as follows: "Act 4807. Section 8. Forms of certificates shall be issued by said board under the seal thereof and signed by the secretary: first a certificate authorizing the holder thereof to use drugs or what are known as medical preparations in or upon human beings and to sever or penetrate the tissues of human beings and to use any and all other methods in the treatment of diseases, injuries, deformities, or other physical or mental conditions." This is better than Alabama, but leaves much to be desired.

The Washington statute, in its revision dated 1933, two years after the latest revision of the California law, is, in its essential provisions, identical with the foregoing: "Section 10008 . . . authorizing the holder thereof to use drugs or what are known as medicinal preparations in or upon human beings and to sever or penetrate the tissues of human beings and to use any and all other methods in the treatment of diseases, injuries, deformities, or other physical or mental conditions."

The Massachusetts statute does not attempt a positive definition, but in section 7 of chapter 112 there is a partial definition by implication. The law does not apply "to registered pharmacists in prescribing gratuitously, clairvoyants, or persons practicing hypnotism, magnetic healing, mind cure, massage, Christian Science or cosmopathic method of healing, if they do not violate any provision of the preceding section." The preceding section reads in part as follows: "Except as provided in section 65, whoever, not being lawfully authorized to practice medicine within the commonwealth and registered under section 2, or corresponding provisions of earlier laws, or under section 1 or 2 of chapter 526 of the acts of 1909, holds himself out as a practitioner of medicine or practices or attempts to practice medicine in any of its branches . . . shall be punished. . . ." The omitted portion refers to certain misrepresentations. That is, the various groups mentioned may practice medicine in these limited ways if they do not hold themselves out as practitioners of medicine or if they do not make certain misrepresentations about themselves. For the purpose of the statute, their activities are not to be regarded as the practice of medicine, no matter what may be thought of them from other points of view.

These considerations amount to nothing as giving a definition of the practice of medicine. The deficiency in the statute has been met in at least two specific cases by rulings of the Supreme Court of Massachusetts (Comm. *vs.* Jewelle, 199 Mass. 558 and Comm. *vs.* Zimmermann, 221 Mass. 184). In the latter ruling reference is made to the earlier decision, and the most often quoted part of what Chief Justice Rugg said reads as follows: "Medicine relates to the prevention, cure and alleviation of disease, the repair of injury, or treatment of abnormal or unusual states of the body and their restoration to healthful condition. It includes a broad field. It is not confined to the administration of medicinal substances or the use of surgical or other instruments. It comprehends a knowledge not only of the functions of the organs of the human body, but also of the diseases to which those organs are subject, and of the laws of health and modes of living which tend to avert or overcome disease, as well as of the specific methods of treatment that are most effective in promoting cures. In order to practice medicine one need not cover the entire field of the science. If he devotes himself to a very restricted part of it, he may still be found to practice medicine."

This review of the field of the practice of medicine, excellent as it is in some respects, says nothing of unusual states of the mind; it refers specifically only to bodily ailments, and omits reference to disease of the mind, whether somatogenic or psychogenic in origin.

To consider in detail in this discussion the provisions of all of the medical acts of the United States would be time-consuming beyond hope of adequate reward; therefore only such results of the study as seem pertinent for constructive purposes will be noted.

By way of introduction there may be considered some of the fundamental ideas involved in a definition of the practice of medicine. For the purposes of this discussion a restriction of medicine to

human beings is made. Diseases of plants and of animals lower than man do not enter into the definition, however important they may be from the point of view of the welfare of humanity.

In the first place, the "practice" of medicine means doing something, and it has two implications of emphasis, namely, a single act in which the emphasis is on the act, and habitual acts in which the emphasis is on the habit. This double implication need give rise to no confusion, however; yet since it is the practice of medicine that is to be defined, the "doing," whatever it may prove to be, may be denoted by the word "treatment," using this in the most general sense at first, and restricting it as the definition proceeds, by the needed qualifications.

The practice of medicine, then, is at least "the treatment of a person who is sick." This is plain sailing, but the person not sick is sometimes treated as if sick, and his fears are exploited; so the words "or is alleged to be sick" should be added. The nature of the treatment is next to be specified. What means need be employed to constitute practice? If one reviews all that the physician may be called upon to do to or for the patient, either by way of identification or examination or therapy, using medicines or drugs, operative or manipulative procedures, any form of physiotherapy, modification of diet, advice as to change of scene, or way of life, or habit of any sort, one finds the reason for some of the long enumerations of specific acts or groups of acts set forth in other statutes. It is here that a real difficulty in the definition arises. Is there any compact phrase that will comprehend all that a physician may be called upon to do in the way of practice? There is, and it consists of four words: "use of material means." For the definition, since the physician may recommend some form of abstinence, or taking out of stitches or taking off of splint or bandage, "material means" should be further qualified, so as to read "by the use or disuse of material means."

But the definition does not yet exhaust the possibilities, because the intent of the act may make a difference in one's judgment as to responsibility; so that there should be added the words "for the purpose of diagnosis or prevention or relief or cure." Also, since self-treatment is not regarded as practice in the statutory sense, the definition should now read: "The practice of medicine is the treatment by one person of another person who is sick or who is alleged to be sick, by the use or disuse of material means, for the purpose of diagnosis or prevention or relief or cure."

Although this definition is substantially complete, it contains one word which may be unsatisfactory because of its lack of inclusiveness, namely "sick." Is a deformity a sickness? Is a superpilose female sick? She may well feel "sick" as her beard grows, but is she sick? What is meant by "sick" is not the presence of some disease entity such as typhoid fever or acute endocarditis, but a deviation from normal of any character and of sufficient extent to cause the person affected to seek relief, or if the person is irresponsible, as insane, to cause some responsible person to seek relief.

For the purpose of the statute it might be well to prohibit holding oneself out as a practitioner of medicine, specifying in some detail what acts would be regarded as coming within the prohibition, for example, advertising, having an office, using the title "doctor," and others.

The definition of the practice of medicine which has been set forth might prove adequate for relatively simple conditions of life where only the physician and the patient are involved. But with the enormous complication of life today, with the multiplication of parts of medical service, and multiplication of helpers in the division of labor, Will this simple definition be sufficient? Only by resolving the complexity into its elements can the principles involved in the definition be applied and their adequacy be tested.

The term "medical service" has just been used, and as this represents a different and in some respects a very helpful approach, it should be noted carefully. In any service there are at least three elements: the effort of the person rendering the service; the gratification of the person receiving the service; and the intermediate material element by which the service is rendered, which may be simple or of extreme complexity. It is from this analysis that the phrase "material means" in the definition is derived.

In the complete procedure of the "treatment of a person who is or who is alleged to be sick, by the use or disuse of material means, for the purpose of diagnosis or prevention or relief or cure," there are numerous steps, of each of which a record may be kept in great detail. There are the identification of the patient, the complaint, the family and past histories, the present illness, the examination,—so-called "physical,"—with the findings by various laboratory procedures, the diagnosis and finally the treatment, using the word in its limited sense. What parts, if any, of this complete medical service may be delegated to persons not physicians, and what parts, if any, may be performed by the physician alone?

The parts of the service which may be rendered by the physician alone are those which involve interpretation, leading up to diagnosis. At this point in the discussion, the possession of technical skill, whether of the surgeon or of the laboratory

technician, may be disregarded as not entering into the nature of the service. The "physical" examination as made by the physician is not as a rule the purely objective finding of the laboratory from which the report may be, for example, "albumin in urine." But up to the point of interpretation everything may be done by trained assistants who are not physicians. The diagnosis or interpretation should be made by the physician alone.

In treatment, the multiplicity of details makes subdivision of labor necessary and many assistants are required, as nurse, pharmacist, optician, physiotherapist and others. They are all rendering necessary parts of the medical service, but though physically widely separated from the physician, as the pharmacist or optician, their work is done, in some respects at least, under the direction and control of the physician who carries the primary responsibility.

In the description which has been given, the idea of responsibility and control has come to the surface last, but its essential place can now be emphasized. Throughout the rendering of the medical service, the physician has been in control, but many others have participated in rendering the service. Have they also been practicing medicine, and if so, in what sense? In substance, they have been practicing medicine, but such practice under direction is generally permitted by the statute, or is not forbidden. To be sure, to give better protection to the public, such subsidiary practitioners of medicine may be restricted by license and prohibition, after meeting certain minimum requirements for qualification, but if the control is with the physician, the medical practice act is in this respect not violated. What if the control passes in any respect to someone not a physician? Is the medical practice act then violated? If the control over the acts of the physician passes in any respect to someone not duly registered, the act is violated in substance. The control is the essential thing, but in any given case of alleged violation it may be difficult to prove just where the control actually lies.

In the discussion up to this point, nothing has been said about treatment for pay or other recompense, specified or implied, although provisions concerning this condition appear in a number of the statutes. The omission has been due to the irrelevance of the recompense to the nature of the service. The question as to nature of the service, that is, whether it is or is not a medical service, has nothing to do with the recompense. The passing of money is evidence as to the opinion of the person who gave it that some service had been rendered. Its medical nature would have to be determined on other grounds.

Thus, if a physician is employed by a commercial concern and it is shown that his acts constitute the practice of medicine, the mere employment has been taken to show improper participation by the concern in the practice of medicine. Yet on this point opinion is divided and some other qualifications have been introduced as in the case of insurance companies and physicians in industrial plants.

In order to focus discussion on concrete suggestions, there is herewith submitted a tentative draft of that portion of the medical practice act to which a definition of the practice of medicine is pertinent.

General Laws, chapter 112, section 6, now reads: "Practitioners Not Registered; Prosecution: Except as provided in section 65, whoever, not being lawfully authorized to practice medicine within this commonwealth and registered under section 2 of this act, or corresponding provisions of earlier laws, or under section 1 or 2 of chapter 526 of the acts of 1909, holds himself out as a practitioner of medicine or practices or attempts to practice medicine in any of its branches, . . . shall be punished by a fine of not less than one hundred nor more than one thousand dollars, or by imprisonment for not less than one month nor more than one year, or both. A person rendering medical service in violation of this section shall recover no compensation therefor."

It is suggested that the following be added:

Section 6A: For the purpose of this act, the practice of medicine is defined as the treatment by one person of another person who is or who is alleged to be sick, by the use or disuse of material means, for the purpose of diagnosis or prevention or relief or cure.

Section 6B: For the purpose of this act, a person is defined as being sick when said person manifests in any way any deviation from normal of such a character and extent that correction of or relief from the deviation is sought, or when said person is pregnant.

Section 6C: For the purpose of this act, a person is regarded as holding himself out as a practitioner of medicine if he announces to any other person or to the public, a desire, willingness or readiness to practice medicine; or if he opens an office for the practice of medicine; or if he appends to his name M.D., M.B., Dr., Doctor, Surgeon, Healer, Specialist, Professor or any other title, word, letter, or designation intended to suggest or designate him as a practitioner of medicine in any of its branches.

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PSYCHIATRIC SERVICE TO A GENERAL HOSPITAL

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IN 1935 the combined public wards of the Johns Hopkins Hospital made 265 requests for psychiatric consultation, to help in the diagnosis and management of patients entered routinely on the general services for conditions not considered psychiatric at the time of admission. A brief review of our experience will show in what way psychiatry today makes itself helpful to the physician generally. We wish to make clear that the principles involved turn on a simple and common-sense evaluation of human facts rather than on abstruse overspecialization.

Our material offers a wide variety of problems, falling roughly into two groups. In the first, the patient's symptoms and complaints are inadequately accounted for by all the methods of systematic study of organ pathology; or else physical abnormalities are present but are too meager to explain the intensity and variety of the patient's suffering. In either case, the patient is not helped by one's saying, "There is nothing the matter with you." In the solution of these problems, the physicians in charge of the wards felt the need for an understanding of the personality factors underlying or contributing to the complaint. The growth of this phase of our psychiatric consultation service over a period of years indicates on the part of the physician a genuine interest in the patient as an entity rather than in disease as an isolated phenomenon. The average house officer now knows that an elevated basal metabolic rate belongs to an *individual*, who may be beset with difficulties and troubled with emotional problems all of which have their bearing on the function of the thyroid. He knows that fluctuations of blood pressure and the comfort of an asthmatic or an arthritic are not disposed of by speaking of vasomotor stability or instability, sympathetic nervous system balance or imbalance, and constitutional types, but that the tangible and controllable clues are apt to be found in the mental state or personality of the person who shows the disease.

The second group consists of those patients who enter the hospital with complaints suggesting an unrecognized psychotic or semipsychotic involvement; or who develop such a reaction in the hospital, either to the knowledge of their disease or to the complications superimposed upon them by the environment or procedures of the hospital and staff; or whose psychotic reaction exists side by side with certain medical conditions and often profoundly alters or modifies the original symptoms for which they sought help.

In the first group, the fullest understanding of the patient's illness comes from an appreciation that conditions of life and attitudes toward them are fully as important as mere chemical or physiologic disturbances, and often more so. The medical wards offer the widest variety of such interrelated problems. We are sent requests such as these: (1) complaints out of proportion to findings—true hyperthyroidism or high blood pressure, or a state of emotion and tension; (2) weakness and fatigue, dizziness and poor sleep—question of functional disease; (3) complaint of pains in eye, thigh, head, foot, knee, ear, chest—no adequate basis for complaints on examination; (4) invalid reaction, due to situation or personality—for help in management; (5) patient ten years in bed because of weakness—findings negative; (6) vomiting, urgency, and frequency—a chronic pyelitis one year ago is no longer adequate to explain symptoms; (7) suspicious, eccentric, unco-operative Negress with fainting attacks; (8) patient demands to go home but is too sick to leave.

Case 1. A 32-year-old widowed housewife showed every evidence of hyperthyroidism, with tremor, struma and one-sided exophthalmos, but the metabolic rate was only +2. A brief talk elicited a story of prolonged tension, with death of child and husband, irregular employment, and debt. Without iodine or surgery, and with management of her life problems, she recovered fully and the exophthalmos receded.

We have frequently been asked to differentiate true hyperthyroid states and various degrees of anxiety reaction, a clinical state which may resemble hyperthyroidism in every respect except for the uncertain findings of the basal metabolic determination. No organ of the body is exempt from its participation in broader personality difficulties. We have been asked to study fatigue, protracted or paroxysmal, and have frequently found it to represent states of discouragement, disappointment or depression. Thus, we have seen complaints of headache where there really was depression, anxiety or hypochondriasis; we have seen elevated blood pressures strongly dependent upon emotional overconcern which have quieted down very satisfactorily with attention to the emo-

From the Henry Phipps Psychiatric Clinic, Johns Hopkins Hospital. Read before the Baltimore Medical Society, March 6, 1936.

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tional difficulties. There is at present a movement to study essential hypertension as a joint participation of the departments of internal medicine and psychiatry. All varieties of gastrointestinal complaints are seen: nausea, vomiting, abnormalities of gastric secretion, constipation, diarrhea, abdominal pain—often without structural changes or presenting structure-function disturbances as part of depression, or sequelae of chronic alcoholism.

Case 2. Chronic diarrhea of 14 months represented promotion strain and financial worry in a 24-year-old factory foreman, disappointed at having given up college to marry a wife with whom he was no longer compatible, whose parents he disliked, and with whom coitus interruptus was the only form of intercourse. The prospect of a month's vacation and possible change in job brought relief.

In the realm of cardiovascular complaints we have been asked to differentiate chest pain, dyspnea and angina-like discomfort from pure states of anxiety and tension. Hysteria, the classic simulator of disease, has to be differentiated from fainting spells, epilepsy, cerebrovascular accidents, anesthesia, paralysis, blindness, and so forth, and traced to its causes. A variety of skin conditions from hives and allergic reactions to seborrheic dermatitis have shown their close interrelation to constitutional irregularities and personality problems.

Many problems in the management of medical cases have been referred to us, such as overconcern about an illness with need for the patient to make adequate adjustment to disabling conditions.

Case 3. Fullness in stomach and bloated feelings represented a heart scare for a 38-year-old factory worker, who had been told he had a serious heart lesion. The gastrointestinal complaints really represented the worry of divorce, custody of children, and a second marriage, and had no relation to an uncomplicated mitral stenosis. Reassured about his heart and told what work he could do, he was able to return to active life.

Unco-operativeness with refusal to eat or to adhere to a diet, may be due to misunderstandings, misinterpretations, apprehension, rebellion or stubbornness arising from an intellectual equipment too meager to cope with the complicated environment of a hospital. A Binet-Simon intelligence test would determine with what intellectual level we are dealing.

Fear of experiment in a superstitious, unintelligent Italian woman made her unco-operative, refusing to eat, and complicated her recovery from a tuberculous infection because of her constant insecurity and fright, based largely upon the warning of friends that the hospital was a place for experimenting on human beings.

Syphilitics may also call for mental examination on suspicion of paresis or other diseases. Epileptics require particular management, not alone of the attacks but of diet, medication and routine of life. Alcoholic conditions may develop into delirium tremens, Korsakoff's psychosis, acute alcoholic hallucinosis or alcoholic deterioration. Withdrawal, unresponsiveness or dullness may suggest stupor, uremia or diabetes, but also mental disorder. The surgical department has asked for evaluation of headache versus brain tumor, for aphasia and localization studies, for evaluation of mental changes in hydrocephalus, for the study of vertigo in pseudo-Ménière's disease. The gynecologic department has asked for advice and management in cases of sterilization and for treatment of a patient "addicted" to cystoscopy. The ophthalmologic department is no longer satisfied with a statement of hysterical blindness; they want to know the reason for it and to see that the patient is treated. Complaint of pain in the eye, or an actual request for enucleation, or a case resembling myasthenia gravis, is no longer passed by without inquiring into its mental setting. The laryngologic department has asked for evaluation of throat discomforts, sometimes found to be the symptoms of depressed and tense individuals. An insulin shock reaction proved frightening to the physician because of an accompanying transitory excitement resembling schizophrenia.

Case 4. Loss of voice and pain in the throat beginning with laryngitis represented a tense, depressed state in a 45-year-old lawyer, eager for promotion and baffled by the New Deal machinery, overloaded with teaching at night school, and faced with the prospect of divorce. Modification of attitude, relaxation, explanation, and decision to maintain his marriage relieved him of pain, and in 2 months enabled him to resume teaching.

The second group deals with a large variety of psychotic patients. Consultation requests such as these are apt to come in: (1) patient stuporous with right-sided weakness—all findings, including spinal fluid, negative—question of hysteria versus organic hemiplegia—for advice and treatment; (2) patient threatens suicide; (3) patient shows de terioration; (4) patient is delirious at night; (5) patient is excited and disoriented; (6) patient is confused and unco-operative—gets out of bed and wanders around.

In this group, some came to the hospital already psychotic, while others became so there. The commonest psychosis is delirium, with frequently unnecessary fatality. We have seen delirious reactions in senility, cardiac decompensation, fever, uremia, pneumonia, pellagra and alcoholism. A major feature is drug intoxication, which may have developed in the hospital from too energetic therapy with bromides, atropine or some other poorly tolerated drug. The use of sedatives is natural when one wishes to give a sick patient a good night's rest, but one forgets that their elimination

may be slow or defective because of arteriosclerosis, nephritis, and so forth. One must be on the lookout for increasing restlessness or mental cloudiness or increasingly disturbed sleep as a potential precursor of a delirious reaction, not as an indication for increasing the sedative dose.

Case 5. Pantopon, codeine, paraldehyde by rectum, transfusion and fever initiated nocturnal delirium in a 48-year-old man with sinus infection, who gave a history of lifelong nightmares and sleepwalking. Eliciting his co-operation, stopping all sedatives, and having his wife in the room at night accomplished immediate cessation of the delirium.

Alcoholic delirium tremens is undoubtedly the most frequent type of delirium seen. When it occurs a few days postoperatively it may constitute a real hazard to the life of the patient, who, in a frightened and hallucinated state, is quite unable to co-operate with postoperative routine. The amount of alcohol consumed, if any, should be a mandatory part of the history of every patient.

The depressive reaction is the next commonest psychotic one; such patients may come in without mentioning it, complaining rather of some incidental symptom. The ability to recognize a depression should be part of the medical equipment of all graduates of the medical school. It is so protean in its manifestations, its symptoms are so commonly confused with other conditions, the risk of suicide is always so great, and the most desirable therapy is so different from mere bed rest that depressed states should be included as one of the commonest medical conditions. We have been called to see many varieties of such patients: those with recurrent depressions and those with previous phases of elation; those with tension as the outstanding symptom; those with anxiety as the main feature; and a special group of patients who develop in the hospital a depressive reaction to knowledge of their condition. Patients suffering from depression should by preference be occupied with a constructive routine. It is gratifying to find house officers asking such simple questions as "How are your spirits?"—"How does it affect you?"—"Does downheartedness interfere with your sleep, your appetite, your concentration, or has it caused you to lose weight and to have constipation?"—"Do you get discouraged or panicky in despair so that life does not seem worth while?" Any patient who is sad or discouraged is liable to succumb to suicide. Telling criteria of suicidal risk are fairly easy to elicit, and their presence should call for special observation or attention. Both medical and surgical wards may well have rooms with protected windows opposite the nurse's desk where potentially suicidal patients can be adequately observed. Neglect of this precaution is bound to be distressing and embarrassing to the hospital and relatives, as well as a possible basis for medicolegal entanglement. Our nursing staff with experience in the Phipps Clinic is alert to the danger of suicide. The physician who recognizes a depressed individual, regardless not only of his incidental but of his original complaint, can take the proper steps to treat the fundamental emotional disturbance. A tense, depressed patient should not be considered merely for the disturbance of his autonomic nervous system, although he may have symptoms suggesting cardiac dysfunction, respiratory disturbance or conditions commonly recognized medically as "effort syndromes" or "neurocirculatory asthenia." Patients readily pick up terms and detect the pessimistic tone and apprehension of the physician.

Rarely a week goes by that we are not asked to evaluate suicidal risk. This is particularly true in patients admitted following suicidal attempt. There have been attempts with bichloride, iodine, and carbon monoxide by patients who were genuinely depressed, by schizophrenics, by paranoid individuals and by a larger group of unstable so-called psychopathic individuals in whom suicidal attempt was impulsive, a spite or a jealousy reaction, usually of a dramatic character. The latter usually repent within twenty-four hours and give no indications of a genuine depression. A truly depressed individual, however, will *remain* a suicidal risk throughout the entire period of his depression. It is necessary to know the setting of the attempt, to take a little time to learn the human facts back of it, its *sincerity* and the completeness of preparation for it. It may be necessary to consider the advisability of transferring the patient to a hospital equipped for such emergencies.

A great variety of psychotic reactions which developed in the hospital were found. Henry Head in 1901 described mild mental disorder accompanying referred pain and discomfort in the head. The hospital physician will do well to be prepared to meet similar emergencies in a general ward. We have encountered manic reactions; various types of depressions; psychoses with encephalitis; confusional psychoses associated with cardiac decompensation; religious excitement occurring with fever; schizophrenic psychoses; postoperative states, including delirium tremens; confusional states due to drugs, fever, toxic absorption or situational factors; panic reactions, which can be very disorganizing; posttraumatic delirium; postpartum psychoses; epileptic states aggravated postoperatively; and senile conditions either with confusion following operation (not uncommon after prostatectomy) or with delirium, sometimes with urinary retention. Postoperative scare over unexpected symptoms may be trifling or assume the propor-

tions of a psychosis. A recent patient of limited intelligence, unwarned of the readjustment necessary after bilateral vestibular section, showed discomforts and disappointment on the basis of which he developed a full-fledged reactive depression with suicidal content. Most physical illnesses are accompanied by varying states of fear, apprehension, misunderstanding and misinformation, which can be foretold. Often this condition is enhanced by injudicious management or the misunderstood advice of physicians. To relieve such patients of their apprehension is frequently to lay the ground for speedier recovery. Bandaging of both eyes and prolonged convalescence in darkened rooms are particularly apt to make trouble. Frequently such panic reactions are of a deliroid character, and are quickly abated by returning the patient to a ward or home environment where he feels secure, or by such a simple procedure as the visit of a familiar relative or the unbandaging of one eye.

We use drugs sparingly, and limit ourselves to a few whose effectiveness have been proved with our patients. As hypnotics, for immediate sleep, paraldehyde 15-20 cc. and chloral 0.5-1.0 gm. are quite effective. For prolonged sleep, the barbiturates have proved best; barbital, luminal, dial, and amytal are our choices. Certain combinations are effective, such as barbital and luminal or pyramidon. Chloral has certain cardiac dangers; barbital may cause renal damage. Sulfonal and trional are not used because of toxicity. Occasionally low blood sugar and low blood pressure in older individuals cause sleep disturbance; carbohydrate and coffee, respectively, are effective. As sedatives to allay general restlessness, small divided doses of barbital are best; bromide and sedormid are less effective. Morphine and hyoscine are rarely recommended but are useful in some types of excitement.

Arteriosclerosis should make one particularly careful with drugs. Those which are slow in excretion are apt to accumulate within the arteriosclerotic individual over a period of days to the point of causing delirium; morphine and hyoscine frequently accentuate such reactions. The use of atropine for postoperative eye conditions can bring about delirium in susceptible individuals. An interesting delirious reaction recently observed was due to the inhalation of trethylene by a patient with tic doulourex. In the use of sedatives one must always bear in mind the possibility of later addiction. Paraldehyde carries a particular hazard in certain alcoholic patients. The perils of morphine derivatives are too obvious to mention. Two cases of sodium amytal addiction have been studied. Elixir of alurate may cause addiction because of the high alcoholic content.

The hospital call system may need explanation to avoid upsetting some patients. A middle-aged man, after operation for perforated ulcer, developed a seemingly delirious condition of which the outstanding features were auditory hallucinations; these later proved to be largely elaboration around the ticking or calling system, which in his delirious state he did not understand.

Repeatedly we find patients apprehensive from discussion during ward rounds or clinic presentation.

This is a brief cross section of the variety of problems met with in a general hospital. Some of the psychotic group can be adequately handled only by specialists in psychiatry. Many of them, however, can be managed equally well by the general physician alone, provided he is sensitive to the ever-present factor of the patient's personality as contributory to the medical problem.

The stories back of such conditions are not difcult to obtain. Psychiatry is not a foreign land. What we chiefly want to know is under what conditions things occur. Even with the specialist, a few simple questions constitute a psychiatric history. One need not hesitate to ask certain personal questions because of the patient's sensitiveness; patients are glad to discuss such facts with one who remains objective and free of personal embarrassment. What is your complaint, and how did it develop? Were you worried at the time? What things concerned or distressed you? Were things going smoothly at home, at work, and with relatives or friends? Any quarrels, disappointments, shocks or fright? What do you think causes your condition? Have you heard things about your illness that worry you? Any relatives or friends have a similar condition? Are you apprehensive about your future, or troubled by memories or past experiences?

Even when the patient can see no correlations, one can quickly go through the items of a personal review. Anything unusual in your childhood? How far did you go in school? Did you like it? Any failures? What jobs have you had? Are you happy in your work or are there difficulties? When were you married, and are you happy in your marriage? How do you get along with your husband (or wife)? Any children? Do the children worry you? Do you want more children? Do you do anything to prevent pregnancy? If so, does it worry you? Are sex relations satisfactory? Do they lead to relaxation or unrest? Any worries about masturbation? Any financial problems? Any debts? What is your religion? Does it give you concern? Are you moody, cheerful, friendly? What are your hobbies? Do you enjoy movies, friends, athletics? Any tendency to nervousness or any nervous breakdowns in your family—parents, grandparents, brothers, sisters and so forth?

Such a brief psychiatric history quickly elicits facts of importance without difficulty. Apprehension over a hospital routine, worries of home and finances, and unemployment, for example, make a difference to the happiness or security of the individual, and thereby contribute to his function or malfunction as a human being or medical problem. Failure to learn such facts frequently means that the patient leaves the hospital unimproved and dissatisfied, or—worse—that he starts a migration from doctor to doctor or clinic to clinic, often further involving himself through conflicting advice.

Precipitating factors are often acute: operations, a death in the family, an accident, infection, a quarrel with family or neighbor, knowledge of infidelity, fright, a misunderstood hospital procedure, a chance remark of nurse or physician, awareness of anxiety on the part of the hospital staff. More often, insidious and prolonged factors lead to a development of strain, tension or worry which culminates in the patient's illness. Irregularity of work, inadequate income, work under pressure, ambition beyond capacity, promotion, illness of relatives, religious conflicts, sex ruminations and conflicts, contraceptive worries, fear of pregnancy, fear of death or wasting disease, long-drawn-out convalescence, knowledge of incurable and crippling disease, prolonged use of sedatives, conflicting medical statements or advice, charity status, the misinformation and misguided advice of other patients and innumerable other life factors, all take their toll in undermining the patient's confidence and security, leaving him apprehensive, discouraged and puzzled. Any of these states of mind may cause or enhance physical complaints and visceral participation.

To appreciate fully what these facts mean to a patient we need to understand differences in personality. It is not a puzzle; physicians are learning to listen, and are becoming less apt to rush in with theories. Many of these patients give evidence of constitutional instabilities dating back to childhood; for example, the so-called neuropathic traits such as bed-wetting, night terrors, timidities, and protein sensitivity.

When called to see such a patient, we ourselves first learn the findings of the physical examination; we are then ready for intelligent reassurance, if needed. Next, we note the patient's complaint and try to re-create all the factors as they exist in his life. When these are clear we settle for the patient the issue of the heart or thyroid, acquainting him with the results of the examinations and assuring him that his physicians are in agreement as to the meaning of the findings. Such examinations should be completed as soon as possible. To drag them out for weeks is to undermine the patient's confidence; it is well to remember also that unnecessary or purely investigative procedures may do harm. The next step is to reassure the patient that the findings are definite, and to convince him of the soundness of the suspect organ; it sometimes takes rather dramatic methods to do so. He is then taught that the symptoms represent the participation of his body in various emotional states, and is shown how the factors which have just been elicited play their role in producing the part-participation of the physiologic system. It does little good to tell him that the symptoms are imaginary or unimportant; he needs to be given understanding of their role as an expression of various states of mind, worry, apprehension, and so forth. We may have to show him how unfortunate life situations call out their physiologic accompaniment, just as Cannon showed us the same reactions to fear in his laboratory animals. It is often gratifying to see how patients have been groping toward such an explanation in a spontaneous fashion. It is common to hear, "Why, I've known that all along. I knew it was just worry." Others are ashamed to admit that their personalities could upset them so. We interview a responsible member of the family in the patient's presence, giving him or her the same understanding of the dynamics of the case and eliciting co-operation.

We may then set out to ameliorate the environmental and precipitating situations. When the patient is willing, we can often accomplish a great deal in reorganization. The social worker can frequently do wonders for us by going into the home and smoothing out difficulties. We do not hesitate to recommend and arrange for a change in employment if that seems indicated. There are very few Baltimore industries which are not eager to help us in getting a worker out of a difficult situation into one where he feels at ease. In the same way we are able to count on the assistance of schools, churches and social agencies. Through our influence many patients have been placed in jobs when the financial burden seemed to be the outstanding factor. We work for an increase in the weekly financial contributions of the social agencies when this seems desirable.

In our consultation work we look for the factors that are making trouble, so that we may give the patient and the physician in charge the simplest formulation of what has gone wrong and how it is complicating other medical issues. This may entail an analysis of disturbing situations and their role in causing or enhancing the complaints, and a plan of procedure for their eradication or management; it may lead to a statement that the fundamental basis of complaint is a psychotic reaction. Many such cases can be quite adequately handled on the

general wards; where this is impossible psychiatric hospitalization is fairly easily obtained, either at the Phipps Dispensary or by consulting the Board of Mental Hygiene. Commitment in Maryland is a simple procedure involving only the consent of relatives and the certificate of two licensed physicians five years out of medical school; commitment papers unfortunately still use the word "insane."

More often our attempt is to re-establish the patient's confidence so that the physician in charge can carry on his own treatment. Where more detailed analysis is needed the Phipps Dispensary is eager to co-operate. Often a single interview brings about a real change in attitude and a gain in confidence. Discussion of problems is an experience that often brings relief, and to objectify them is to release the patient of their burden. An order for "suicidal observation" ensures the patient a private nurse or attendant. Simple drugs, hydrotherapy and attention to everyday worries and anxieties often enable the physician to conduct needed medical and surgical treatment in spite of psychotic involvement. Thyroid patients are being treated by continuous baths. The cold wet pack might well replace the indiscriminate use of sedatives, and with training in relaxation, solve many sleep problems. Occupational therapy would put an end to many hours spent in bed in rumination and worry.

The goal of our consultation service is to help physicians in the common-sense management of their patients' psychiatric problems. When we recommend procedures, or by our contact can create a status of relaxation, freedom from worry and anxiety, and an increased sense of security in the hospital environment, we feel that we have made our best contribution.

ACUTE SUPPURATIVE PAROTITIS IN THE NEWBORN

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ACUTE suppurative parotitis developing on the sixth day of life is of rare occurrence. The following case developed after a brow presentation with extensive edema of the face and eyelids, and for this reason is unique, so far as we can determine from the literature. This condition should be of interest to the obstetrician, and attention is called to the possibility of suppurative sialoadenitis as a complication of brow and face presentations, due either to trauma of Stensen's duct in the usual mechanisms of labor or to the forcible wiping out of the infant's mouth when it presents during delivery.

CASE REPORT

A full-term infant, weight 8 lb., 7½ oz., was born in the hospital, New Bedford, on December 29, 1936, after a long labor. The presentation was a brow with considerable edema of the face and forehead. No instruments were used. The baby had considerable mucus in the throat but cried well after removal of the mucus by inversion and gauze wipes. The baby's condition was noted as "fair." Two days after delivery subconjunctival hemorrhages were noted, and a temperature of 103.8° F. developed. Despite clyses and rectal irrigations this temperature of septic type persisted. On the 6th day the right parotid gland was found to be enlarged, hot and tender. Several whitish spots appeared on the buccal mucous membranes. It was evident that this was the underlying cause of the temperature, and massive warm boric compresses were applied over the gland. On the 7th day thick creamy pus could be expressed from Stensen's duct by gentle pressure over the parotid, and a culture was taken. This showed streptococci on direct smear and colon bacilli and *Bacillus alcaligenes* in the culture.

Owing to continued high temperature and evident fluctuation over the parotid gland, three incisions were made on January 8, 1937, at the sites indicated on the diagram (Fig. 1).

FIG. 1.

Thick creamy pus was evacuated through incisions Nos. 2 and 3; none through incision No. 1. Rubber tissue drains were inserted through and through. Drainage was adequate, and after 2 weeks the incisions were closed with complete absence of parotid redness and induration. After a few days, however, swelling and redness returned. The old incisions were reopened and considerable pus was expressed. A new incision, No. 4, failed to reveal new pus.

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Swelling and redness persisted, with accompanying marked edema of the eyelids. On February 13 there was evident fluctuation, and an incision was made at site No. 5. A large amount of pus was evacuated, and subsequent improvement was rapid; the swelling, redness and induration disappeared, the lid edema cleared, and at the time of discharge healing was complete.

FIG. 2. Acute suppurative parotitis. Taken fourteen days after the first operation. Note direction of incisions.

No treatment for the stomatitis was given. Dilute breast milk (2 parts to 1 of saline) was given with difficulty by Breck feeder. As the infant refused to suck, gavage feedings were started and were continued for 5 days. Frequent clyses of saline were used from the start.

Elterich,[1] in 1933, reviewed the literature concerning acute infections of the salivary glands in the newborn. In 1921 Plewka[2] collected 51 cases, 42 of which were in the parotid gland. Since then only 4 cases have been reported (Brandt,[3] Tambato,[4] Elterich,[1] and Decker[5]).

Bacteriology. The most frequent organisms found are streptococcus, staphylococcus, pneumococcus, colon bacillus and *Oidium albicans,* and to these can be added *Bacillus alcaligenes.*

Pathogenesis. Plewka[2] believed from the histologic analysis of his cases that the majority of these infections are ascending. Some authorities feel that the disease may be metastatic, but the prevailing weight of opinion inclines toward the ascending route. Certainly in the case just reported there can be no question as to the mode of infection. Bretschneider[6] states that the disease is frequently found in premature infants and the mortality is high (40 per cent). Brandt[3] reports a case in a seven-day-old baby with a gonococcal infection of the umbilicus. Puerperal disease and fissured nipples may increase the possibility of infection.

Diagnosis. Any of the salivary glands may be involved, but the majority are parotids, and the lesion is usually unilateral. Swelling is the presenting symptom. The temperature may be high and septic, or in debilitated children very low or normal. Hardness, heat and tenderness are always present. Often before fluctuation over the gland is found, pus may be expressed from Stensen's duct by pressure over the cheek.

Prognosis. Well-nourished, full-term babies usually recover, depending, of course, on their individual resistance and on the prompt recognition of the condition, with early multiple incisions as soon as the fluctuation is elicited. In premature infants the prognosis must be guarded, as the mortality is high. Streptococcus cases, usually with secondary invaders, particularly where there is extensive stomatitis, are much more serious because of toxemia and the possibility of extension into the mediastinum. Cases of extension into the external auditory canal have been reported.

Treatment. Operation should not be delayed. As soon as fluctuation is found multiple incisions should be made, the operator exercising great care not to invade duct tissue near the facial nerve. Rubber dam or elastic band drains are satisfactory. Massive warm boric acid compresses for a few hours facilitate drainage.

These cases never drain spontaneously through Stensen's duct, as multiple foci are present when the diagnosis is made, on account of the anatomic structure of the parotid gland and the histology of the ducts. Usually several pockets are found, although Brandt[3] drained a case through a puncture incision. The surgeon must risk the production of subsequent salivary fistulas and not hesitate to make a sufficient number of incisions.

Cases with extensive stomatitis present a difficult feeding problem, and, as in the case reported here, gavage may have to be used until the infant will suck a rubber nipple. It should never be put to breast for obvious reasons; breast milk, similac, or whole milk mixtures with barley water and karo should be given either with a Breck feeder or by gavage. Gavage necessitates handling, and involves the theoretical danger of trauma in an infected area, but this method may be lifesaving.

The less local treatment there is of the stomatitis, if present, the better. One per cent aqueous solution of gentian violet may be indicated if *O. albicans* is present, but no swabbing of the mouth is otherwise indicated. The swallowing of large amounts of pus apparently does no harm.

SUMMARY

Purulent parotitis may be a complication of brow and face presentations, and too energetic wiping of the mouth by the gloved finger in any sort of delivery may predispose to its development.

Operation by multiple incisions should be performed as soon as fluctuation is detected.

Care should be taken to avoid facial nerve injuries and subsequent permanent paralyses.

Clyses, breast milk and the minimum of handling are the chief supportive measures.

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A STUDY OF PHOSPHATASE ELEVATION IN NEOARSPHENAMINE ADMINISTRATION

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ARMSTRONG and King[1] have shown that when a definite liver poison, such as chloroform, phosphorus or toluylenediamine, is administered to dogs, there is an elevation in the serum phosphatase which precedes other signs of liver damage and is generally proportionate to it. In addition they have pointed out that as recovery takes place the phosphatase activity diminishes, and is usually the last evidence of liver damage to disappear. A patient was recently seen who had a painful exostosis resembling in many ways a neoplastic growth. This patient had also been under active treatment for syphilis, and at the time the exostosis was being studied showed a high phosphatase activity. About two weeks later she showed jaundice and a still higher phosphatase value. These observations taken in conjunction with Armstrong and King's work, led us to study whether phosphatase determinations could be used as an indication of early liver damage, especially in patients receiving neoarsphenamine.

CASE REPORT

October 27, 1935, Miss R. McS., Deaconess Hospital No. 78212, age 23, single, complained of a painful right shoulder of several days' duration. She had been doing heavy work moving beds and thought her shoulder was dislocated. Her history revealed acquired syphilis of 11 months' duration, which had been treated with neoarsphenamine and bismuth at the outpatient department of another hospital. Following the last injection of neoarsphenamine she felt nauseated and dizzy. No other evidence of intoxication existed.

Physical examination revealed no skin or mucous membrane lesion. The heart, lungs and abdominal organs were normal. Gynecologic examination was negative. The head of the right humerus was in the correct position; the shoulder was normally rounded. About midway on the anterior lip of the bicipital groove was a tumor fixed to the underlying bone; the overlying tissue was tender. This mass measured 2.5 by 2 by 1 cm. No other tumor masses were present on the humerus. The x-ray report read: "There is density, slight thickening and irregularity of the cortex below the crest of the greater tubercle of the right humerus. This extends downward for a distance of 6 cm. below the tubercle. No soft-part shadow is visible. Films of the skull, cervical spine, opposite shoulder and lower two thirds of the tibiae are negative. There is a congenital anomaly of the fifth and sixth cervical vertebrae, the two bodies being fused. The findings suggest the possibility of a syphilitic lesion. A primary bone tumor cannot be ruled out."

Other laboratory reports included the following. Urine analysis was not remarkable except for a very slight amount of albumin and a trace of sugar. The red blood-cell count was 4,900,000, with a hemoglobin of 76 per cent (Sheftel); the white count was 4,950, with a normal differential, an increase in platelets and some variation of the red cells in size and shape. The plasma phosphatase was 0.83 Kay units (normal range 0.10-0.21 units), phosphorus 3.9 mg. per cent, serum calcium 9.3 mg. per cent and icteric index 5; the blood Hinton was positive.

After consultation with Dr. C. C. Simmons and Dr. C. C. Lund, the danger of bone sarcoma was considered sufficient to indicate a biopsy. We were led to this opinion more by the finding of the elevated phosphatase than by the x-ray appearance of the tumor. A biopsy was taken November 4, 1935. At operation the tumor mass was found to be made of dense bone, too dense for frozen section. It looked grossly like periostitis. The pathological report by Dr. Shields Warren was periostitis. The day following the operation the phosphatase was 1.2 Kay units. Four days postoperatively the wound was healing perfectly, and the patient was discharged from the hospital. There was no longer any pain.

She was referred for further treatment of her syphilis. This consisted of two injections of bismuth. She first noticed jaundice on November 22, but thought it of no significance and did not report it. On December 2, she felt definitely ill and reported her jaundice. The icteric index was 20. On December 3 the patient left the community and has not been seen since. This sudden departure was unfortunate because we have had no opportunity to do other liver function studies. As a result all we have to indicate liver damage in the patient is the elevated phosphatase and an icteric index of 20.

Because the pathologist's report ruled out bone sarcoma and because the repeated tests ruled out laboratory error, we concluded that the elevated phosphatase must have been due to the neoarsphenamine treatment, although we knew of no previous reports indicating this. To prove or disprove this point it was decided to carry out routine phosphatase determinations on patients with untreated syphilis of short duration, with long-standing untreated syphilis, and with syphilis undergoing active treatment, and to conduct phosphatase, icteric index

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and liver section studies on healthy dogs receiving neoarsphenamine.

In the clinical observations all classes of patients with syphilis were included, except secondary cases without treatment. No attempt was made to correlate exactly the intensity of the therapy with the phosphatase value. Among the patients receiving therapy the number of injections varied from one to more than forty. Our original case was not included in this study.

TABLE 1. *Phosphatase Activity in Treated and Untreated Cases of Syphilis*

	Avge. Phosphatase (Kay units)	Jaundice	Luetic Aortitis or Periostitis
No arsphenamine therapy (3 cases)	0.17	0	2
Arsphenamine given (12 cases)	0.28	2	1

In the laboratory investigation, in order to obtain definite intoxication with neoarsphenamine and to study the progressive changes, if any, in the liver, we selected two healthy dogs. We administered intravenous doses in proportion many times greater than those used for human beings, for we wanted to produce definite intoxication, and felt certain that with clinical doses the experiment would have been unprofitably prolonged, and would have required more animals than justified. Furthermore, it is our belief that dogs are more resistant to neoarsphenamine than are human beings. At determined intervals their serum icteric indices and

TABLE 2. *Phosphatase Activity in the Three Stages of Syphilis, Treated and Untreated.*

	Primary Syphilis		Secondary Syphilis		Tertiary Syphilis	
	With Treatment	Without Treatment	With Treatment	Without Treatment	With Treatment	Without Treatment
No. cases	3	1	2	—	7	2
Avge. phosphatase (Kay units)	0.22	0.15	0.24	—	0.31	0.18

TABLE 3. *Dog 1. Male, Airedale.*

Date	Weight	Plasma Phosphorus	Serum Calcium	Plasma Phosphatase	Serum Icteric Index	Neoarsphenamine Injected	Total Neoarsphenamine	Remarks
	kg.	*mg. %*	*mg. %*	*Kay units per cc.*		*mg.*	*mg.*	
2-29		3.8		0.031	Normal			
3-2		4.0		0.027	Normal			
3-4	18.64							
3-5		2.5	10.8			120		
3-7		3.8		0.024	Normal		120	
3-9		4.0		0.019	Normal		120	
3-10						180		
3-11		3.8		0.030	Normal		300	
3-14		3.7		0.030	Normal	279	300	Showed first signs of illness
3-16		4.0		0.175	4		579	
3-18		5.2		0.53	7	279	579	
3-21	18.18	6.1		0.70	12	279	858	Biopsy of liver showed slight bile staining
3-23		6.3		1.04	10		1137	
3-25		4.9		1.68	9			
3-28		4.8	9.4	2.54	8			Phosphatase 85 times normal
3-30		6.2		2.31	4			
4-1		6.4		2.11	7			Biopsy of liver showed slight necrosis and bile staining
4-3								
4-4		6.2		1.69	5			
4-6		4.8		1.33	5			
4-8		4.0		1.08	5			
4-11		4.0		0.81	4			
4-13		4.0		0.56	3			
4-15		4.0		0.58	2			
4-21		3.5		0.34	2			CO_2 combining power 46 vol. per cent
4-27		5.3		0.14	2			NPN 36 mg. per cent
5-4		4.5		0.106	2			
5-11		5.3		0.107	1			
5-18		6.9		0.085	Normal			
5-25		3.3		0.057	Normal			

plasma-phosphatase and phosphorus values were determined. The phosphatase studies were made by the method of Kay and expressed in Kay units.

The clinical data are summarized in Tables 1 and 2. The former gives the average phosphatase activity in treated and untreated cases, with and without complications; the latter that in the three stages of syphilis, with and without treatment.

The general trend of the phosphatase is upward with continued neoarsphenamine therapy. Syphilis does not cause elevation even though there is evidence of long-lasting and severe infection.

The results shown in Table 3, which is a summary of the experimental work with Dog 1, demonstrate that neoarsphenamine markedly stimulated phosphatase formation; at the peak it reached a value eighty-five times that of the control determination. In Table 4, the record of Dog 2, there is shown a slower and less pronounced elevation, yet a very definite one. This difference demonstrates that dogs, like human beings, vary in their sensitivity to neoarsphenamine. The icteric index failed to show a significant rise in either dog. The dogs' urines, however, were heavily bile-colored.

The symptoms and signs of neoarsphenamine poisoning shown by the dogs were loss of appetite, generalized weakness, especially of the hindlegs, lowered resistance to infection (skin ulcers, pneumonia) and lassitude. One showed gradual recovery and lowering of phosphatase, but never returned to normal. The other died suddenly of pneumonia. Microscopic examination of biopsied liver sections revealed no abnormalities except slight bile stasis. Autopsy studies, gross and microscopic of the bone marrow, kidney, liver, spleen and pancreas from Dog 2, showed no deviation from the normal.

TABLE 4. *Dog 2. Female, Airedale.*

Date	Weight	Plasma Phospho-rus	Serum Cal-cium	Plasma Phospha-tase	Serum Icteric Index	Neo-ars-phena-mine Injected	Total Neo-ars-phena-mine	Remarks
	kg.	*mg. %*	*mg. %*	*Kay units per cc.*		*mg.*	*mg.*	
2-29		4.4		0.053	Normal			
3-2		4.1		0.054	Normal			
3-4	20.9							
3-5		4.3	10.0			150		
3-7		5.2		0.041	Normal		150	
3-9		4.3		0.039	Normal		150	
3-10						225		
3-11		5.1		0.041	Normal		375	
3-14		4.0		0.039	Normal	315	375	
3-16		4.4		0.041	2		690	
3-18		4.2		0.042	3	315	690	
3-21	20.45	4.7		0.036	Normal	315	1005	
3-23		4.9		0.041	2	315	1320	Biopsy of liver showed no pathologic condition
3-25		4.5		0.046	3		1635	
3-27						409		
3-28		4.4	9.9	0.035	2		2044	
3-30		4.6		0.031	2	409	2044	
4-1		4.1		0.035	2		2453	
4-2						640		
4-4		4.4		0.037	1	900	3093	
4-6		4.8		0.034	1	900	3993	
4-8		4.2		0.032	1	900	4893	
4-10						1350	5793	
4-11		4.8		0.035	1		7143	
4-13		5.2		0.035	2	1800	7143	No food taken
4-14							8943	No food taken
4-15		8.3		0.08	5			Dog definitely ill
4-16		7.8		0.12	9			Dog ill. Biopsy of liver showed slight bile stasis
4-18					7			No food taken
4-21		7.0		0.24	5			Phosphatase 6.4 times normal. CO_2 combining power 33 vol. per cent
4-22								Dog died. Autopsy showed pneumonia

CONCLUSIONS

1. Syphilis, per se, does not elevate the blood plasma phosphatase.
2. Neoarsphenamine intoxication in dogs elevates the blood plasma phosphatase.
3. Such phosphatase elevation precedes the rise of the icteric index.
4. Long-continued neoarsphenamine administration in therapeutic doses causes a slight elevation of blood plasma phosphatase in human beings.
5. Phosphatase determinations may be of value as a means of indicating early liver damage in cases under treatment with neoarsphenamine.

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REFERENCE

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PROGRESS IN PSYCHIATRY IN 1936

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THE psychiatric literature of years gone by gives intimations of some of the difficulties involved in an accurate evaluation of the events that have occurred in the realm of psychiatry during the year 1936. We are familiar with the findings and theories of earlier investigators which in their particular day were regarded as distinct advances but which later failed to stand the test of time. Thus it is with a certain reluctance that I write of progress in psychiatry; a review of psychiatric literature for 1936 might have been a more suitable title for this report.

Within recent years the scope of psychiatry has been extended to include so great a variety of types of human behavior that the task of keeping abreast with the numerous publications bearing on the subject has assumed Gargantuan proportions. Specialties have developed within the field. Clinical psychiatry, mental hygiene, psychoanalysis, delinquency, feeble-mindedness, problems of heredity and child guidance, each has its devotees and literature. For obvious reasons, a detailed review of all that has transpired in these different fields during the past year is impractical and of doubtful value. I have endeavored therefore to report, with comment in some instances, only the contributions which seem most significant for the majority of readers.

INSULIN HYPOGLYCEMIC SHOCK TREATMENT OF SCHIZOPHRENIA

In the field of clinical psychiatry, the insulin hypoglycemic treatment of schizophrenia has occupied a position of considerable prominence. Some authorities have spoken very favorably of it; others have been pessimistic about its possibilities. While Sakel,[1] the originator of the treatment, first began experimenting with the method at the Neurological and Psychiatric Clinic of the University of Vienna in October, 1933, and published piecemeal some of his findings in 1934 and 1935, the procedure did not attract the attention of many workers in America until Dussik and Sakel[2] summarized the results of their findings in May, 1936.

Up to that date the authors had treated 104 patients. Of this number, 58 were "early" cases (sick less than six months), and 46 were "old" cases (sick longer than six months). The series included the paranoid, the stuporous and excited catatonic and the depressive-hypochondriacal forms of the disorder. In 88 per cent of the early cases, the patients obtained a good occupational remission; 77 per cent of all early cases showed a complete remission. Of the 46 old cases, 47 per cent showed a good occupational remission, and 20 per cent a complete remission. Three patients died during the course of the treatment.

The technic of the treatment, as described by these investigators[2] consists of administering once and sometimes twice daily intramuscular injections of small doses of insulin to fasting patients. The dosage is increased by 5 to 10 units daily until the number of units that produces coma is reached. The time and amount of insulin required to bring about coma varies in individual patients. In this series the dosage varied between 20 and 260 units. Coma or shock appeared forty-five minutes to five hours after the administration of insulin. Once the dosage which is required to produce coma is established, the patient is then given this amount of insulin daily until the desired results are obtained.

The patient's reaction to this established dose is not always consistent; that is, it may either fail to produce coma or it may initiate reactions of such violent nature that the insulin must be varied in amount as the condition demands. The patients in this series were permitted to remain in coma from a few minutes to one and one-half hours, depending upon their condition. Then carbohydrate, usually in the form of glucose, was ad-

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ministered through a nasal tube or intravenously. Obviously, the procedure is a drastic affair and requires close attention from the physician and nurse. Despite this factor, Sakel, as well as others who have engaged in the treatment, has noted few ill effects in the patients.

Concerning the rationale of the treatment, Sakel[3, 4] does not present a clear description of his theory. It appears that he assumes that the nerve cells are set in action by a humoral "exciting substance," and that in schizophrenia the cells are exposed continuously to the action of a stimulating substance resembling adrenine. According to his belief, the adrenine-like substance acts upon the cells excessively, and as a consequence of this, normal stimuli to the cells initiate pathologic responses. Insulin acts as an antagonist and it opposes the action of the adrenine-like substance in a way that is beneficial to the patient. The shock or coma associated with its administration plays a conspicuous role in this improvement, but Sakel considers the main factor in the treatment to be the hypoglycemia, which is supposed to act by neutralizing the "exciting substance," and by removing substances toxic for the body in general and by a balancing of the metabolic levels.

Sakel believes that the adrenine-like substance does not merely overstimulate the nerve cells but also reactivates embryologic and phylogenetically ancient conduction paths whose functions are normally overshadowed by the more recently developed ones. In such fashion, many primitive patterns of behavior come into action again. This, according to Sakel, explains much of the odd behavior observed in some cases. Insulin removes the effects of the adrenine-like substance and reestablishes the normal function of the cells.

The theory suggests that the author has attempted to explain in physiologic and anatomic language what has been referred to by other workers in psychologic terms as regression. The formulations, however interesting, are not associated with sound physiologic or anatomic proof. Thus, we are still in the dark with regard to the mechanisms underlying the symptoms of the disorder, as well as the changes which have been observed in the patients during and following the treatment.

Besides Dussik and Sakel, Strecker,[5] Langfeldt,[6] Friedlaender,[7] Wortis,[8] Gross[9] and Glueck[10] have published articles dealing with insulin hypoglycemic treatment. With the purpose of ascertaining the possible hopefulness, severities and dangers of the treatment before instituting it in the hospitals for the mentally ill in England, the Board of Control sent Dr. Isabel Wilson to Vienna and Berne in February, 1936, to obtain firsthand information from those engaged in the investigations. Wilson[11] published the results of her observations and her conclusions and recommendations in the form of a monograph which appeared in July. Her conclusions were as follows:

(1) The results of the hypoglycemic shock therapy as published in a number of countries indicate that the treatment is promising.

(2) The association between insulin treatment and clinical improvement is occasionally very striking.

(3) The degree of response to be expected cannot be clinically prophesied in any case or group of cases.

(4) Because of the difficulties of diagnosis and the variability in spontaneous reactions in response to physical and psychologic treatments which schizophrenia may show, published statistics on the effect of insulin therapy must be regarded as only tentative; for in groups of treated cases, the percentage of those in whom remission or improvement can be definitely ascribed to insulin treatment cannot be accurately deduced, and longer and further experience will be needed before a firm opinion can be reached as to the influence of insulin treatment on the duration of a remission or on the tendency to relapse.

(5) The method certainly merits ample clinical trial.

(6) The treatment is neither too dangerous nor too unpleasant to be used in a serious disorder.

(7) Many aspects of the action of insulin in the psychosis invite further study and research.

After observing some of Cameron's[12] patients at the Worcester State Hospital, reviewing their records and talking with a relative of one patient who is said to have improved under the treatment, I agree essentially with Wilson's conclusions. There is something to be said for and against the claims made. The dramatic improvement in the patient's mental condition immediately after regaining consciousness is remarkable. However, the change calls to mind the responses elicited in schizophrenic patients by conditions of shock brought about by the administration of high percentages of carbon dioxide. One wonders if some of the results obtained in insulin therapy should not be evaluated in a similar light. The workers with whom I have talked, including Sakel, object to judging the favorable changes as purely a matter of shock to the organism. Many of the patients treated have experienced remissions of too long a duration for such an assumption to seem tenable. On the other hand it must be borne in mind that the majority of the investigators who have reported favorable results emphasize that the treatment brings about remissions most readily in acute cases—according to Sakel, in patients who have been sick less than six months. Every psychiatrist who is

familiar with the disorder is aware that many patients with schizophrenia experience remissions without having had any specific form of treatment other than that administered in routine hospital care. Moreover, the preliminary question of what one includes under the diagnostic heading "schizophrenia" must be answered before an accurate evaluation of the results of therapy applied to the condition can be made.

Many psychiatrists find it extremely difficult to classify, in terms of our present official nomenclature, patients who manifest emotional turmoil, excitement, confusion and stuporous behavior along with vague and transitory delusions. Sometimes a period of six months elapses before the true seriousness of such conditions can be determined. Many patients run a more or less self-limited course and recover completely; others are not so fortunate. Therefore, a very great number of patients must be subjected to the treatment before one can be sure of a specific relation between the favorable changes noted in these patients and the insulin therapy. Such a connection may be present, but the literature on the subject and the nine patients whom I have seen under treatment have left me in doubt. It will be of interest to follow the results of the various investigators throughout the world who are now engaged in carrying out the treatment.

OPERATIVE TREATMENT OF THE PSYCHOSES

In a work entitled *Tentatives Opératoires dans le Traitement de Certaines Psychoses,* Moniz[13] has presented some novel and interesting ideas that have been the source of considerable comment among psychiatrists and neurosurgeons. The monograph deals with the author's theory and work on the operative treatment of psychotic patients. The rationale of the operative procedure seems to have sprung from physiologic observations, chief of which are the work of Fulton and his associates and the findings of Brickner[14] on a patient of his who underwent a bilateral frontal lobectomy.

The gist of the theory is that the anterior portions of the frontal lobes of man have cellular connections with a large portion of the cortex involved in mental phenomena. Moniz regards the frontal lobes not as a discrete center but as a conglomeration of cells from which run a variety of association fibers; in some of the so-called functional psychoses there is, according to him, a fixation of certain patterns of relation among groups of cells. This condition results not so much from pathologic conditions of nerve cells as from fixed arrangements of their multiple connections. These fixations in turn instigate and maintain the rigid ideas and delusions encountered in morbid psychic states. Therefore, Moniz was led to his experimental procedure, which consists of destroying part of the ovale centrale of both frontal lobes. This was accomplished in the first group of cases by means of injecting absolute alcohol just under the cortex into the white matter, about midway between the frontal pole and the central gyrus. In a later group of cases, a so-called leucotome was used.

Moniz's monograph is based on an experience with 20 cases, 14 of which were asylum cases and 6 from the author's private practice. He asserts that the cases were of relatively long duration and appeared to be hopeless. The diagnoses attached to the cases are as follows: involutional melancholia, 1; anxiety psychosis of the involutional variety, 1; anxiety melancholia, 5; anxiety neurosis, 3; mania, 3; paraphrenia or schizophrenia, 7. Obviously these terms are a bit confusing. Seven patients experienced clinical cures, 7 obtained considerable amelioration of symptoms, especially those of psychomotor activity, and 6 remained in their preoperative condition. Anxiety symptoms were universally improved, and in only a single case was there a relapse.

Many unpleasant postoperative neurologic symptoms, such as fibrillary contractions of the masseter muscles, sphincter disturbances, digestive disorders, ocular aberrations, nystagmus, and ptosis of the lids, developed in some of the patients, but such symptoms proved to be only temporary. Apathy, loss of initiative, stereotypy and sometimes mutism followed the operation, but they also soon disappeared.

With regard to intelligence and memory, Moniz comments as follows:

"In all of our tentative operations, one fact presents itself with great clearness: this is that the destruction of a considerable number of connections in the two prefrontal lobes is not accompanied with any, or at least with no great, repercussions in the sphere of intelligence and memory. Even in those cases in which we have made the prefrontal barrier by alcohol or which have been reoperated upon, the patients have remained almost in the same state as regards their intelligence and memory."

In this country, Freeman and Watts[15] have performed the operation on 6 patients for the relief of anxiety, apprehension, nervous tension and insomnia. "The immediate results have been satisfactory," and "certain other symptoms such as depression, preoccupation, disorientation and delusions have been favorably influenced." The "outstanding deficit symptom" was a certain lack of spontaneity. Freeman and Watts have stated that relief of symptoms is almost immediate. They were not sure how long the patients would remain

improved, but at the time of the publication of their paper (January, 1937) all patients seemed to have maintained their original improvement. However, at that date control patients had not been studied, that is, patients subjected to simple anesthetization, incision of the scalp, the drilling of holes in the skull, and so forth, without operation on the frontal lobes. A study of such a series of cases would be important in view of the number of psychoses which undergo an improvement and even recovery following a simple shock, in the sense of an impending danger to the organism.

It is difficult to accept Moniz's statements pertaining to intelligence and memory. The nature of the operation, which is supposed to interfere with connections that have the most intricate ramifications, and clinical experience with personality and mental aberrations developing after injury or local disease to the frontal regions, make me uncertain as to the nature of the observation of these patients before and after operation. "Intelligence" is a difficult word to define, and one wonders how Moniz uses it when he refers to the patients as showing no disturbance of intelligence. Though the operation is far from being as drastic as a lobectomy, it must influence some of the functions which have been described as being altered after frontal lobectomies, particularly since both lobes are subjected to the operation.

Penfield,[16] in his clinical studies of patients after lobectomies, has demonstrated that "initiative and capacity for planned action were clearly defective. This was especially true of a woman of forty-three. She had become incapable of discerning for herself possible courses of action so that she might choose." Moniz refers to a loss of initiative, apathy and mutism in some of his postoperative patients, but these symptoms disappeared shortly after the operation. If this is the case, a great step forward has been made in the treatment of a certain group of psychoses. Even though some residual persists after the operation, the patients may be better in that the distressing features of their illness have disappeared, and they are enabled to return to the community somewhat reduced in efficiency, but more useful than they were before the operation. An objection to this way of regarding such an outcome may be raised: By what criteria is one to judge the cases referred to by Moniz as being hopeless? Patients who have suffered from anxiety states and depressions for three, four, five and even ten years and have eventually recovered are not uncommon.

An excellent report on the significance of the frontal lobes for mental performance will be found in an article by Goldstein.[17]

ELECTROENCEPHALOGRAM

The action potentials, which were recorded from the human scalp for the first time in 1929 by Berger,[18] continue to occupy the attention of investigators throughout the world. Papers by Davis and Davis,[19] Kreezer,[20] Gibbs, Lennox and Gibbs,[21] Lennox, Gibbs and Gibbs,[22] which were read in the form of a symposium on the subject before the section on nervous and mental diseases at the annual meeting of the American Medical Association in May, 1936, summarize most of what is known about electric potentials.

Davis and Davis,[19] after giving a historical account of the findings of other investigators, reported their own findings on normal persons in ordinary states of cerebral activity. Under their standard conditions a given person reproduces on successive tests his own type of record, which may be characterized by: (1) the presence or absence of a regular alpha (approximately 10 per second) rhythm; (2) the frequency of this rhythm, which in their subjects ranged between 8 and 13 per second; (3) the lability of the rhythm which is almost continuous in some persons while in others the percentage of the time that the rhythm is present varies considerably from test to test; (4) the degree and duration of suppression of the rhythm by standard stimulation, particularly by opening the eyes in darkness, in moderate illumination and in bright light; (5) the prominence of other waves, whether or not of regular frequencies, such as beta waves (those with a frequency of 25 per second, according to Berger), which often appear in the record simultaneously with alpha waves.

Davis and Davis conclude that "the cortical electrogram reveals some inborn feature or pattern of cerebral activity. The pattern is labile, to be sure, but the degree of lability seems to be one of its inborn characteristics. The cortical electrogram apparently conforms to the biologic law of similarity of identical twins. How much broader the law may be we do not know."

The authors raise a number of questions. Among them are: What is the physiologic significance of a spontaneous cortical rhythm, and why should increased activity, such as vision, reduce it, as it apparently does? To what extent may these patterns of activity be related to anatomic areas and known functions? Are abnormal patterns to be found in pathologic conditions?

The other authors cited think they have an answer, at least in part, to the last question. Gibbs, Lennox and Gibbs,[21] in their work on epileptics, have found that a 3-per-second wave and spike pattern in the electroencephalogram is pathognomonic of petit mal. They think that the frontal lobe is

more intimately connected with the source of the pathologic electrical activity associated with such seizures than any other cortical areas accessible from the surface of the head; the type of this activity tends to be characteristic for the particular cortical area which produces it. These investigators also found that "certain conditions which alter the electrical activity of the cortex of normal subjects alter also the pathologic electrical activity which is associated with epileptic seizures. Attention and the inhalation of carbon dioxide, both of which decrease the fluctuations in voltage of potentials from the cortex, tend to prevent the appearance of petit mal waves." Phenobarbital and sodium bromide prevent or alter the pathologic activity associated with the seizure.

As to states of mental deficiency, Kreezer[20] observed that the principal types of rhythms found in the records of normal persons occur in those with the Mongolian and those with the hereditary types of mental deficiency at various intelligence levels. The alpha and beta rhythms occur in mental defectives of these types. As to whether any particular characteristic of the electroencephalogram varies with the mental age within each group of mentally deficient persons, Kreezer has the following to say about the Mongolian type: "When all the subjects are arranged in order of mental age and the associated properties of the records examined, no indication of a variation with mental age is found down to a mental age of about five years. Below this level there are marked indications of differences of two kinds. First, the records show a much smaller percentage of regular alpha rhythms and a greater percentage of irregular sequences. Second, the records show the phenomenon of large waves of long duration, with a frequency of about five waves per second."

Kreezer thinks his results are of particular interest in the light of Berger's report that at about the age of four years the electroencephalogram of the child first acquires the characteristics found in that of the normal adult. The implication of his results is that "the decisive factor in this transition is the increase in chronological age only so far as it is accompanied by an increase in mental age." The author speculates about possible changes in cortical structure and function which may occur at at about the age of four, and which in turn may condition an increase in the regularity of the electrical activity of the cortex, but he warns us of the dangers of regarding his results as a basis for a diagnosis of mental deficiency at any level by means of the electroencephalogram.

Lemere[23] found on a study of normal people that some subjects produced "good" alpha waves of relatively high regularity and amplitude. In others the waves were "poor," being irregularly present. In any one subject the ability or inability to produce good alpha waves remained remarkably constant. There was a tendency for the waves to become worse on subsequent trials. Mildly manic or depressed patients gave good Berger (alpha) rhythms, provided no associated presenile or arteriosclerotic signs of mental deterioration existed. Schizophrenic patients, on the other hand, nearly always gave a poor alpha rhythm. The author postulates a close relation between the affective capacity of a person and his ability to produce good Berger or alpha rhythm.

Hoagland, Rubin and Cameron[24] have studied the electrical brain waves in schizophrenics during insulin hypoglycemic shock treatment. They have found that the waves from the scalp of these patients show a progressive decline in alpha wave frequency of some 40 per cent, which parallels, with a time lag of some minutes, the declining blood-sugar curve. Sugar injected during coma restored the frequency. The brain-wave records show that the variability, which the investigators determined quantitatively through arbitrary procedures, follows an inverse relation to the sugar curve. The investigators believe their results confirm Hoagland's view "that brain wave frequencies under standard conditions are proportioned to the local respiration of the cortical cells." They are also of the opinion that the measured variability in a given case is an index of the severity of psychosis and may serve as a measure of therapeutic efficacy.

DELIRIUM TREMENS

On the basis of a belief that cerebral edema is present in delirium tremens, Cline and Coleman[25] and Piker and Cohn[26] have presented data concerning their results with the dehydration form of treatment. The authors seem to have been guided by the earlier studies of Steinebach,[27] Hoppe,[28] Goldsmith,[29] Ebaugh and Johnson[30] and others. Their procedure consists of partial spinal fluid drainage (50 to 75 cc.), the administration of 50 per cent dextrose intravenously and of magnesium sulfate by mouth, the limitation of fluid intake for the first twenty-four hours and paraldehyde for sedation. Piker and Cohn,[26] in their more recent report, stated that they supplemented the dehydrative measures with a high caloric diet, rich in vitamin B, and supportive cardiac stimulants. Both groups of workers reported favorably on the treatment, but their statistical figures are somewhat equivocal. For example, Cline and Coleman state that "the average duration of hospital residence in the alcoholic group was reduced from 7.94 days in the earlier period to 6.69 days in the period of study." Those who are familiar with the treatment of uncomplicated cases of delirium tremens know that

one and a fraction days is an insignificant figure when applied to the period of hospitalization.

At the Boston Psychopathic Hospital, Thomas, Semrad and Schwab[31] have had experience with the dehydration form of treatment in delirium tremens. They did not observe the increase of spinal fluid pressure in uncomplicated cases, which has been referred to by the workers cited. Nevertheless, the results of this form of treatment have been favorable. On the other hand, they had still better results with a series of patients who were given large amounts of saline by hypodermoclysis after sedative doses of paraldehyde. As soon as the patients awakened, they were started on a high caloric diet. The favorable results in both instances may seem puzzling unless we bear in mind that in the two forms of treatment the patients were placed on diets of high caloric value. This factor is of importance because almost every patient with delirium tremens admits that he has neglected his food before the onset of the delirium. Thus, the withdrawal of spinal fluid may not have been of as much significance as the combating of the acute undernutrition.

BODY BUILD AND SERUM LIPOIDS

Attempts to discover a relation between physique and personality have occupied the attention of investigators from time to time since the days of ancient medicine. In modern psychiatry a variety of terms has been applied to fat and lean men, but Kretschmer's[32] designations, pyknic and asthenic, are probably most familiar to American psychiatrists. Kretschmer has demonstrated that persons with a pyknic habitus (middle height, rounded figure, a broad face on a short massive neck and a deep-vaulted chest) commonly have cyclothymic temperaments and if they suffer from mental disease, it tends to be of the manic-depressive variety. Persons with the opposite habitus, the asthenic (lean and narrowly built), are often schizothymic and tend to develop schizophrenia if they experience a psychosis.

Laboratory studies of the blood lipoids of individuals free from evidences of disease have disclosed remarkable variations in the total fatty acid and cholesterol determinations. But as Gildea and his associates[33] have pointed out, relatively few attempts have been made to discover a relation between morphologic characteristics, personality and blood lipoids. To this end Gildea, Kahn and Man[33] have reported the results of their studies on the serum lipoids (total fatty acids and cholesterol) in healthy men and women who corresponded to Kretschmer's descriptions of the pyknic and asthenic physiques. They found that the total fatty acids and cholesterol were consistently higher in the 17 men of the pyknic build in their series than they were in the 24 men of the asthenic make-up. The serum lipoid values of 16 normal men, who were neither pyknic nor asthenic in their body-build corresponded closely to the mean values for all the 57 men studied. The difference between the total fatty acids of the pyknic and asthenic men was marked, over eight times as large as the probable error of difference. Serum lipoid studies on 45 healthy women, who were selected and grouped on a basis of the same criteria used for the men, did not reveal such clear-cut differences. Nevertheless, the serum fatty acids tended to be higher in the pyknic women than in those of the asthenic build, the difference being over two times as large as the probable error of the difference. In the male subjects the authors noted fair correlations between pyknic body-build, high output of energy and high lipoid values. Asthenic body-build, low output of energy and low lipoid values showed fair correlations. This was not true, however, of female subjects. When psychologic factors were brought into consideration, the correlations became increasingly obscure in both sexes.

The actual figures are of interest. They found the wide range in serum lipoids reported by previous investigators—total fatty acids 8.3 to 34 milliequivalents, cholesterol 130 to 280 mg. per cent. The mean value for total fatty acids in 17 pyknic men was 17.3 milliequivalents, for 24 asthenics 10.9, for 16 persons neither pyknic nor asthenic 12.7. The mean cholesterol values were reported as 230 mg. per cent for pyknics, 168 mg. for asthenics and 203 mg. for the intermediate group.

Brice[34] has found the cholesterol and total fatty acids of the blood of schizophrenics low, and as a result, he attempted to raise the values by feeding high-fat diets to such patients. His efforts have been unsuccessful.

PSYCHOANALYSIS

Among the significant articles in the field of psychoanalysis is one by Alexander and Menninger[35] on the study of constipation. In their study of the psychogenic factors involved in gastrointestinal disorders, conducted in the Chicago Institute for Psychoanalysis, they were struck by the frequency of marked paranoid and persecutory tendencies in some cases of chronic constipation. It was thought that such patients went farther in misinterpreting their environment than did the merely depressed patients. For example, the latter simply believed that nobody gave them anything of value, but in the paranoid cases the patients thought that whatever they received was actually harmful, an attitude which was expressed in the delusion that their food was poisoned.

In keeping with these findings, Alexander and Menninger distinguish between two types of constipation cases: those exhibiting prominent features of melancholia and those showing predominantly paranoid trends. They held that the frequent paranoid tendencies in certain types of constipation might have also a causal psychodynamic relation to intestinal retention. In order to test the validity of this theory they investigated 100 patients showing persecutory delusions and 100 control patients, with reference to their excremental habits and to their attitudes toward the excremental functions and toward food. In the control group, there was an incidence of constipation of 26 per cent, in contrast to the incidence of 72 per cent in the individuals suffering from persecutory delusions. It was concluded that "these figures in connection with the psychologic attitude toward the excremental function and food expressed by these paranoid individuals confirm our conclusion that the psychodynamic basis of constipation is the same in psychotics suffering from persecutory delusions as in chronic constipation cases which show only traces of a paranoid attitude."

The authors concluded further that "the frequent constipation of patients suffering from persecutory delusions is mainly conditioned by their conflict about sadistic tendencies which they deny and project. Their frequent depreciatory attitude and delusions about their food is another manifestation of the projection of their anal sadistic impulses."

Other articles of clinical interest appearing in the literature of psychoanalysis during the past year are "The construction of depression" by Georg Gerö[36] and "The genesis of psychical conflict in earliest infancy" by Joan Rivière.[37] The former was awarded a clinical prize by the Institute of Psychoanalysis. It describes the analyses of 2 severe cases of neurotic depression, special attention being given to technical questions which the author considers often neglected in treatment. The latter article, as the title implies, deals with the origin of infantile and early childhood conflicts from a Freudian point of view, but at times the author deviates from the beaten paths and voices theoretical views that will probably elicit objections from members of this school.

PROLONGED NARCOSIS OR "DAUERSCHLAF" IN THE TREATMENT OF PSYCHOSES

Prolonged narcosis in the treatment of psychoses dates from the latter part of the nineteenth century, when attempts were made to allay excitement and restlessness by prolonged ether and alcohol narcosis. Since then a variety of drugs has been used for this purpose. Kläsi[38] introduced somnifaine in 1922 and treated 22 cases of schizophrenia with this narcotic agent. The publication of his results led to a more extensive trial of the drug, especially in Europe. Opinions concerning the efficacy of somnifaine narcosis, as well as of that produced by other drugs, as a form of treatment of the psychoses have varied. In view of this variation, the 1936 reports of Hennelly, Parfitt and MacNiven are of interest.

Hennelly's[39] series consisted of a medley of 88 manic-depressive cases; 32 patients recovered, 26 improved and 30 showed no change. Where recovery or improvement occurred, the change was thought to be related to somnifaine therapy. Parfitt[40] treated 7 cases of "pure mania." One was a chronic case, and no benefit followed after a full course of treatment. Another was a chronic case with a history of two previous attacks, both lasting two months. This patient recovered after fourteen days of treatment. The remaining 5 were acute cases, all of which had had a previous attack. One patient died under treatment. Two who received a full course were discharged after a stay in the hospital of four months and twenty months respectively, whereas their previous attacks had lasted ten months and forty months respectively. In the remaining 2, treatment was abandoned because of the appearance of toxic symptoms. MacNiven's[41] series included 40 cases (manic-depressive and schizophrenic). The author states the following conclusions about this treatment: "Prolonged narcosis with somnifaine in a considerable number of cases produces marked improvement in the patient's condition. In a certain number of these cases the duration of the illness is shortened by the treatment. In a large proportion . . . improvement is only temporary, but there are others in which permanent improvement, not reasonably to be expected to occur, has resulted from the treatment. Treatment is of value in benign types of psychoses. It is of doubtful value in well-established cases of dementia praecox, and even in the benign types of psychoses it is impossible to predict the result of the treatment."

All investigators have emphasized the risk to life involved in this treatment. One may well imagine the problems that will be encountered in keeping a patient asleep for from ten to sixteen days. Those who have used the treatment to any great extent list signs of cerebral irritation, tachycardia, ketonuria, vomiting, a fall in blood pressure and pyrexia as not uncommon complications. The use of insulin and glucose has been helpful in combating ketonuria.

To carry out the treatment with as few risks as possible, skilled nursing is of paramount importance. Readers who have a special interest in

prolonged narcosis treatment will find a report of a symposium on somnifaine narcosis which was conducted at a meeting of the Royal Medico-Psychological Association, Glasgow, in the July issue of the *Journal of Mental Science*.

MENTAL HYGIENE

The broad range of work in the field of mental hygiene may be gleaned from recent words of Hincks,[42] medical director of the National Committee for Mental Hygiene. "Our first concern was the mental hospital, and for many years we were engaged in the task of assisting in the transformation of the old-time custodial asylums into centers providing humanitarian care and keen scientific attention to the problems presented by the patient population.

"Our next interest was the development of adequate outpatient mental hygiene clinics with special arrangements for children. Since the social worker has much to contribute to our field, the mental hygiene training of social workers became a significant part of our program. . . . Today we are keenly interested in research, in the training of personnel, in clinics and community programs for mental health, in safeguarding the mental health of school children, in the further development of mental hospitals, in public education."

Recent papers in mental-hygiene literature dealing with education range in titles from "Mental hygiene aspects of the day nursery" by Beer[43] to "College standards and human values" by Aikins.[44] Tillotson[45] and Raphael[46] have reported on the mental-hygiene work which has been in progress at Harvard University and the University of Michigan. Both workers have emphasized the need of psychiatric aid in hygiene programs for large universities. They point out that more intelligent assistance may be given to many troubled, neurotic and sometimes even psychotic students if the psychiatrist is a component of the university hygiene unit; that in a university community, as in any other, one may expect to encounter situations in need of attention along mental hygiene lines. Within recent years a few universities other than the two cited have included psychiatric workers in their health programs.

With regard to some of the current views pertaining to mental disease and sterilization, studies of the offspring of dementia praecox stock by Canavan and Clark[47] are of interest. In 1923 these authors made a study of the children of dementia praecox patients. One thousand names of patients with the single diagnosis of this disease were taken alphabetically from the Boston Psychopathic Hospital index cards; 925 were of marriageable age, 275 were married (5 twice), and of this number 194 were women. The analysis consisted of an investigation of 381 children, the offspring of 136 matings; 86 deviated from the normal either mentally, physically or socially. The majority of children of school age were in school at the time of the investigation. The older children were for the most part engaged in gainful occupations. Those who deviated from the normal consisted of 5 dementia praecox patients, 4 feeble-minded, 12 backward, 12 "nervous," 17 physically diseased and 36 with conduct disorder; 58 of these were under sixteen years of age, and 28 were over sixteen years.

In July, 1936, the same authors[48] reported further observations on some of these children. Marriage of some of the mothers and changes of address prevented locating all the children; 117 children of 44 of the original matings were traced. Of these, 9 were dead; of the 108 surviving, 51 were females and 57 males. Fifty-eight, or 53 per cent of this number had at the time of the study presented no symptoms that called them to the attention of hospitals, courts, guardians, truant officers or the like. The mother was the parent with the mental disorder in 30 instances, the father in 6. The authors emphasize the complications and difficulties that might arise in a home when the mother is removed and when the responsibility of keeping the family together falls on the father. One half of the 58 children who were considered normal at the time of the investigation were then under twenty-one years of age. As Canavan and Clark point out, this fact should lead one to be cautious concerning prognosis. Of the 50 abnormal children, 3 were committed to mental hospitals, 2 of them with a diagnosis of manic-depressive psychosis. Thus, so far as the authors have been able to determine, only 8, or 2 per cent, of the 381 patients living at the time of their first study have been committed as insane.

Pollock, Malzberg and Fuller,[49] Smith[50] and others have written on the subject of heredity and environment in relation to the psychoses.

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CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTEMORTEM AND POSTMORTEM RECORDS AS USED IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

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CASE 23341

PRESENTATION OF CASE

First Admission. A twenty-nine-year-old American mechanic was admitted complaining of weakness and cough.

About fifteen years before entry the patient developed a rather severe productive cough, and occasionally expectorated bloody sputum. He did not consult a physician but went to the Maine woods, where he lived an outdoor existence for nine months, and returned markedly improved. The cough had subsided completely. He remained well until four years before entry, when he felt weak and rundown. A physician was consulted, and sugar was found in his urine. Hospitalization was advised but refused by the patient, who continued without any special diet. Four months before entering this hospital he noted progressively increasing polyuria, polydipsia, and vague, dull, bilateral lumbar pain. Two and a half months before his first entry, on his way home from work, he coughed, then vomited and raised some blood in the vomitus. He did not vomit again, but during the next three days he raised some blood-streaked sputum. Following this episode he suffered from epigastric discomfort occurring about two to four hours after meals. The pain was generally relieved by the ingestion of food. For several days after the hematemesis there was a cough productive of a small amount of blood-streaked sputum. There was a loss of about 12 pounds in weight during the four months preceding entry. There was no further nausea or vomiting.

The patient had been subject to frequent head colds and repeated, persistent winter cough, productive of yellowish sputum.

Physical examination showed a well-developed but poorly nourished young man in no acute discomfort. The tongue and pharynx were beefy red in color, and the tonsillar ring was considerably hypertrophied. A few small discrete nodes were palpable at either angle of the jaw. The heart was normal. The blood pressure was 110/75. Chest expansion was symmetrical. One examiner stated that the lungs were negative, but another reported impaired resonance over the right apex posteriorly and in the infraclavicular region bilaterally. Breath sounds and tactile fremitus were normal, but there were a few coarse crackling rales heard just above and lateral to the right nipple. The remainder of the examination was negative.

The temperature, pulse and respirations were normal.

Examination of the urine showed a specific gravity of 1.010. Benedict's test exhibited a brick-red precipitate. The sediment was negative. The blood showed a red cell count of 6,200,000, with a hemoglobin of 75 per cent. The white cell count was 14,000, 71 per cent polymorphonuclears. The stools were negative. A blood Hinton test was negative. A fasting blood sugar was 260 mg. per cent.

X-ray examinations of the chest and gastrointestinal tract were negative. A Graham test showed a very faint dye shadow in a normally situated gall bladder. There were no visible stones. Overlying the ilium and sacroiliac joint was a group of dense, irregular shadows believed to be calcified glands. The outlines of the right kidney were visible and the lower pole was blunt and somewhat lobulated.

The patient remained afebrile throughout his hospital course and was treated by diet and insulin. He improved considerably and was discharged on the twenty-fourth day with the diabetes controlled.

Final Admission (five years later). About eight months after discharge the patient suffered a brief period of "coma," which was relieved by the administration of orange juice. This was believed to be insulin shock. He discontinued attendance at the clinic about four years before re-entry, but continued with the prescribed dietary and insulin regime. A year later he became comatose for a period of about eleven hours, and was treated intensively at another hospital. Following his discharge he developed a slight cough. This persisted, became productive, and gradually increased in severity so that six months before returning to this hospital he raised about a cupful of yellowish, occasionally blood-streaked sputum daily. During the last six months of his illness he lost about 5 pounds in weight and suffered from "pleurisy" in the region of both scapulae. He continued with his work, however, until the day before readmission, when he developed generalized abdominal pain. Associated with the pain were nausea and repeated vomiting of dark-brown material. On one occasion the vomitus consisted of blood. During the evening his breathing became heavy and sighing in character, and his eyes were glassy. Shortly afterward he became stupor-

ous and gradually lapsed into coma. At the onset of this acute episode the temperature was 104° but later fell to 94°F.

Physical examination showed a well-developed, thin, comatose young man with sunken cheeks. The breathing was hyperpneic. The skin was dry and loose, and the eyeballs were soft. The mucous membranes were very dry and one examiner noted an odor of acetone on the breath. The pharynx was slightly injected. The heart sounds were of poor quality and very faint. No murmurs were heard. The blood pressure was 60/20. Examination of the lungs was unsatisfactory. There was questionably impaired resonance at the right base, and a few fine rales were audible at both bases. Deep reflexes were present but sluggish. The remainder of the examination was negative.

The temperature was 100°F., the pulse was 110. The respirations were 30.

Examination of the urine showed a specific gravity of 1.020, with a trace of albumin. A brick-red precipitate was obtained with the Benedict test. Tests for acetone and diacetic acid were strongly positive. The blood sugar was 370 mg. per cent, and the CO_2 combining power 10 vol. per cent.

During the first five hours in the hospital the patient received 340 units of insulin, and saline and glucose parenterally. At the end of this period the blood sugar was 230 mg. per cent and the CO_2 combining power 29 vol. per cent. He remained unconscious, however, and the temperature rose to 107°F. He died twenty-one hours after entry.

Differential Diagnosis

Dr. James H. Townsend: "About fifteen years before entry the patient developed a rather severe productive cough and occasionally expectorated bloody sputum." This story is so indefinite that we cannot attach much significance to it except to remember that there was bloody sputum at that time. Whether it was simply blood-streaked or contained a considerable quantity of blood, we do not know.

"A physician was consulted, and sugar was found in his urine." From later developments I think we might assume that that was the beginning of the diabetes, at the age of twenty. It is interesting that he went nearly four years without any medical advice before he got into serious trouble. You will remember that previous to insulin the average duration of life was four and a half years. This man did very well with himself.

Four months before entry we first find the clinical symptoms of diabetes appearing, and again the occurrence of bloody sputum. This once more raises the suspicion that we may be dealing with tuberculosis in a diabetic. There are also stomach symptoms. I think we ought not to assume that there is gastric pathology. Either with tuberculosis or uncontrolled diabetes one may get gastric symptoms. His symptoms were like ulcer in their time relations, but such symptoms may be simulated by either condition.

"Two and a half months before his first entry, on his way home from work, he coughed, then vomited and raised some blood in the vomitus. He did not vomit again, but during the next three days he raised some blood-streaked sputum." One would get the impression that the blood probably came from the lungs rather than from the stomach. It was more than just blood-streaked sputum, and must be taken seriously.

"There were a few coarse crackling rales heard just above and lateral to the right nipple." If these crackling rales were persistent in that position, which is toward the apex, I think that they are of great significance.

In the laboratory findings, we have all the criteria necessary for a diagnosis of diabetes, and presumably the disease started at the age of twenty. Acetone bodies are not mentioned.

I am surprised about the negative chest x-ray findings and would rather like to see the film, but I understand that it is not available. The negative gastrointestinal x-rays are perfectly consistent with the picture.

The calcified glands may be of some importance as denoting a previous focus of tuberculosis, possibly related to his illness at fifteen, when he cured himself by going to the Maine woods.

"He was discharged on the twenty-fourth day with the diabetes controlled by diet and insulin." How much insulin?

Dr. Tracy B. Mallory: He was getting about 30 units a day.

Dr. Townsend: He was therefore a moderately severe diabetic at that time.

He adhered to his discharge diet and insulin, but during four years his requirements might have changed considerably. We do not advise our clinic patients to stay away four years, but sometimes they do.

"A year later he became comatose for a period of about eleven hours, and was treated intensively at another hospital." That presumably was not insulin shock but an attack of acidosis which apparently was of some degree of severity since he was unconscious for eleven hours.

"Following his discharge he developed a slight cough. This persisted, became productive, and gradually increased in severity so that six months before returning to this hospital he raised about a cupful of yellowish, occasionally blood-streaked

sputum daily." That would indicate that he must have had an extensive pulmonary process, most likely tuberculosis. It might be any of the other purulent processes, possibly bronchiectasis, or one of the other unusual infections such as those caused by fungi; but in any case at that time there was definite evidence of an extensive, serious, chronic pulmonary process of some sort.

"The day before readmission he developed generalized abdominal pain. Associated with the pain were nausea and repeated vomiting of dark-brown material. On one occasion the vomitus consisted of blood. During the evening his breathing became heavy and sighing in character and his eyes were glassy. Shortly afterward he became stuporous and gradually lapsed into coma. At the onset of this acute episode the temperature was 104° but later fell to 94°F." I should say that this was about as classical a description of the development of severe diabetic acidosis going into coma as one could ask. The symptoms do not always appear in that same order, but those same symptoms are repeated in various orders in almost every case—abdominal pain, repeated vomiting of dark-brown material, heavy breathing and stupor. One would expect that the temperature of 104°F. was caused by some sort of infectious process and was not just due to the disturbed physiology of uncomplicated diabetic coma. The fall in temperature to 94°F. indicates increasing severity of the acidosis.

It is a very significant finding that the blood pressure fell to 60/20, a level which indicates the patient was in severe shock as well as severe acidosis. The outlook was extremely grave.

Examination of the lungs in an unconscious patient is pretty unsatisfactory. Many patients in coma of that severity show rales in the lungs, but whether they have pulmonary pathology is sometimes a question. In this case we have a good deal of previous evidence to suggest that there was pulmonary pathology.

"Tests for acetone and diacetic acid were strongly positive." These are consistent with coma. The blood sugar of 370 mg. and the CO_2 combining power of 10 vol. per cent are consistent with the degree of unconsciousness and the general severity of the acidosis which he displayed.

I think there is no question that this man had had diabetes for nine years, that he entered this hospital in diabetic coma. Chemically he was showing signs of improvement as the CO_2 combining power went up from 10 to 29. He never recovered consciousness, however, and one cannot say that he ever recovered from the severe acidotic process because many patients who improve chemically remain in shock and die of circulatory complications in the first twenty-four hours. But I do not believe that diabetes was the only disease that this man had. There is considerable evidence of a severe pulmonary process, of a suppurative nature, probably tuberculosis; but we have no bacteriologic evidence unless some sputum was obtained while he was in the hospital. No x-ray was taken.

I should guess that the autopsy showed that this man had extensive pulmonary tuberculosis and that it was this process which precipitated the attack of diabetic coma in which he died.

Clinical Diagnoses

Diabetic coma.
Pulmonary tuberculosis?

Dr. James H. Townsend's Diagnoses

Diabetes mellitus.
Diabetic coma.
Extensive pulmonary tuberculosis.

Anatomic Diagnoses

(Diabetes mellitus.)
Pulmonary tuberculosis, chronic.
Acute tuberculous pneumonia.
Tabes mesenterica.
Chronic pancreatitis.
Hypertrophy of islands of Langerhans.

Pathological Discussion

Dr. Tracy B. Mallory: This man did show a very severe pulmonary tuberculosis. He not only had old lesions at both apices with numerous cavities but also an acute caseous pneumonia of the right lower lobe as a terminal manifestation. More often than not it is impossible to find anything wrong with the pancreas in a patient who dies of diabetes. This case is one of the exceptions in that we found definite pancreatic disease. There was a very diffuse increase in fibrous tissue throughout the organ and a very marked diminution in the number of both the islands and the parenchymal cells, although the persisting islands showed considerable hypertrophy; so that I think we are on safe ground in assuming that at some period in the past he must have had a severe pancreatitis. Unfortunately we did not do the head on this patient. I think it would have been very interesting because the reason why some of these diabetics fail to come out of coma, even when the blood chemistry returns to normal, is still something of a mystery. In this case I have a personal feeling that we should have found a diffuse cortical degeneration, based, I think, not directly on the diabetes but on the state of profound shock that he was in. In patients with prolonged surgical shock we have frequently found very marked degeneration

of the cortical nerve cells similar to those seen following anoxemia. This man, when he entered, had a systolic blood pressure of only 60 and he probably had been in this state for a considerable period of time.

A Physician: I believe that the summary does not record the terminal events correctly. He was transfused once, and received acacia intravenously. My impression is that he came out of coma for two hours and then went back into it as the temperature began to mount.

Dr. Mallory: If that is the case we probably have to raise the importance of the tuberculosis as a factor in his death.

CASE 23342

Presentation of Case

A fifty-nine-year-old American laborer was admitted complaining of difficulty in swallowing and breathing.

About eight months before entry the patient contracted coryza associated with a nonproductive, irritating cough. The coryza subsided in a few days, but the cough persisted and increased in severity. At about this time he noted that swallowing of solid food became increasingly difficult. Liquids passed down easily, but food particles appeared to "stick halfway down." At such times the patient noted difficulty in breathing. Since the onset of his illness there was a rather steady, dull, aching pain in the left chest, extending over the entire precordium into the left axilla. There was no other radiation and no record of exacerbation. Lying on the left side produced a choking sensation and dyspnea. Shortness of breath likewise became increasingly evident on moderate exertion, and the other symptoms became progressively more severe. Because of the dysphagia, food was curtailed, and the patient's weight decreased 15 pounds. Shortly before entering the hospital the cough began to occur in paroxysms, which were associated with wheezing respiration, cyanosis and on one occasion syncope. There was no edema.

Forty years before admission the patient developed a penile ulcer, following which he had a generalized rash. Gonorrheal urethritis was present at the same time. Ten years later he received a series of injections, the nature of which was not known.

Physical examination showed a thin man, breathing in a noisy fashion and suffering frequently from a brassy cough. There was a small corneal opacity on the left, and there were bilateral lenticular opacities. The left pupil was slightly larger than the right and slightly irregular in appearance. Both reacted poorly to light. Numerous small, discrete, shotty lymph nodes were palpable in the inguinal and cervical regions. The chest was barrel-shaped, and dulness was elicited in the interscapular region between the second and eighth thoracic spines. Elsewhere the thorax was hyperresonant. Heart borders were not elicited, and the sounds were distant and obscured for the most part by harsh tracheal sounds. A rumbling systolic murmur was audible all over the upper anterior chest. Peripheral vessels were moderately sclerotic. The blood pressure was 120/90 in both arms. The abdomen was distended and superficial veins were dilated. There was slight clubbing of the fingers and toes. The right knee jerk was slightly more active than the left.

The temperature was 99°F., the pulse 80. The respirations were 20.

Examination of the urine was negative. The blood showed a red cell count of 3,900,000, with a hemoglobin of 70 per cent. The white cell count was 11,400, 78 per cent polymorphonuclears. A stool examination was negative. Both Hinton and Wassermann tests on the blood were strongly positive.

An x-ray of the chest showed that both diaphragms were low in position; the left leaf exhibited very little movement. The right costophrenic angle was obliterated, and there was tent formation of the right leaf. The right lung field was less aerated than the left and there were increased lung markings on the right, more evident in the lower lung field. The heart was small, but there was monstrous dilatation of the aorta, beginning in the ascending aorta and involving the entire arch and first portion of the descending aorta. This dilatation could be separated into two parts: the larger, forming a fusiform dilatation of the ascending and first portion of the transverse aorta; and the smaller, forming a lobulated dilatation at the junction of the arch and descending aorta. There was calcification within the wall of the aorta in this region. The trachea from a point just above the bifurcation down to and apparently involving the bifurcation showed marked narrowing over an area 5 cm. in length. The esophagus was dilated above the dilatation, narrowed within the region of it and displaced anteriorly. The dorsal vertebrae in this region showed shadow defects of their anterior margins.

The patient remained relatively comfortable, and his condition was unchanged. On the fifteenth hospital day an operation was performed.

Differential Diagnosis

Dr. Howard B. Sprague: The interesting point in the onset of this patient's symptoms is that in

spite of what must have been a very high degree of pathology in the chest he had had no symptoms prior to eight months before entry. As is so often the case a respiratory infection with cough appears to have been the trigger mechanism for disclosing the underlying cardiovascular trouble. At the onset he began to show evidence of obstruction in both trachea and esophagus, combined with pain in the left chest. Difficulty in breathing and swallowing became pronounced, and he was unable to keep up his nutrition. The occurence of cyanosis and syncope suggests that there was sufficient obstruction to venous return in the superior mediastinum, along with obstruction to aeration of the lung, so that cyanosis and cerebral anoxemia resulted.

The history of his syphilitic infection is clear, and the diagnosis is definitely supported by positive Hinton and Wassermann tests. There are some suggestive points indicating syphilitic involvement of the central nervous system, and on a statistical basis the chances are about 30 per cent that the central nervous system is involved as well as the cardiovascular. The air-containing elements of the chest show signs of obstruction, not only in the trachea, but perhaps in the primary bronchi, with areas of pulmonary collapse and compensatory emphysema.

As is commonly the case in the presence of aneurysm of the aorta, the heart itself was not involved because of failure of the aortitis to affect the aortic valve region. Rather unusual is the fact that the blood pressure was the same in both arms. There was, however, some obstruction to venous return from the upper abdomen. Slight clubbing of the fingers is sometimes seen in aneurysm of the aorta.

The x-ray of the chest confirms the diagnosis of syphilitic aortitis with two separate aneurysmal dilatations, the first a diffuse dilatation of the first portion of the arch and the other a lobulated dilatation at the junction of the arch and descending aorta. The degree of pressure from this sac is indicated by the finding of erosion of the bodies of the vertebrae.

An operation is said to have been performed. This may have been either a paravertebral alcohol injection for the relief of pain, or an attempt at wiring a saccular aneurysm at the origin of the descending aorta. The most likely cause of death would be rupture of the aneurysm probably into the pleural cavity.

Dr. Robert R. Linton: Wiring of aneurysms has been almost the only available method of treatment in this condition for a great many years. The classical method has always been to insert a long length of wire through a needle directly into the sac, where it was hoped it would curl up into a spiral or loose ball and provoke thrombosis. Unfortunately this method has not proved to be very satisfactory because sometimes the wire descends into the aorta as far as the bifurcation, instead of coiling up within the sac. Although there are a number of cases successfully treated by this method, so many were unsuccessful that it has fallen into disrepute.

Some twenty years ago Dr. G. H. Colt devised a very ingenious method of wiring aneurysms which has proved successful in a number of cases. We have recently used it four times in this hospital. The first case was an aneurysm of the innominate artery which produced pressure on the trachea. Although the wiring had to be repeated in this patient after a year, on each occasion he was definitely relieved for a considerable period and is still alive, but the aneurysm has again begun to increase in size. The second case was the one which has just been discussed. The aneurysm was wired very successfully, and I feel that the procedure in no way contributed to his demise. The second aneurysm in this patient, because of its fusiform character, was not suitable for the same type of treatment. The fourth wiring was done only recently, but at the end of three months the patient is greatly improved and the aneurysm has decreased in size.

The method consists of inserting a wire brush which is made by soldering about twenty or thirty pieces of gold-plated steel wire together at one end. This wire brush is placed in a trocar which is inserted into the aneurysmal sac. Then by means of a plunger the wire is pushed into the sac. As it is released from the end of the trocar it immediately opens out into an umbrella shape.

A wire brush should be chosen which is large enough to fill the sac, so that there is no possibility of the wire escaping down the aorta. Certainly the method has everything to recommend it and, I think, should be used more in selected cases.

Clinical Diagnoses

Aortic aneurysm.
Syphilis.

Dr. Howard B. Sprague's Diagnoses

Aortic aneurysms.
Rupture of aneurysm into pleural cavity?

Anatomic Diagnoses

Syphilitic aortitis.
Multiple aortic aneurysms, syphilitic.
Operation wound: wiring of aneurysm.
Pulmonary atelectasis, left.
Pulmonary congestion and edema, bilateral.

Bronchopneumonia, right.
Multiple pulmonary abscesses, right.
Pulmonary tuberculosis, healed, bilateral, apical.
Pleuritis, acute fibrinous, bilateral.
Pleuritis, chronic fibrous.
(Syphilis.)

Pathological Discussion

Dr. Benjamin Castleman: The autopsy on this man showed two large aortic aneurysms, one in the ascending portion and the other in the descending thoracic. They were so situated opposite each other that the superior mediastinal contents were compressed from all sides. The esophagus was extremely narrowed in its middle third; the trachea was only moderately constricted, but the main left bronchus was almost completely closed off, producing a partially atelectatic left lung. The larger aneurysm began about 1 cm. above the aortic valve, was fusiform in shape, and measured about 10 cm. in diameter and 10 to 12 cm. in length. Its wall was very thin, and the lumen was filled with postmortem clot only. The other aneurysm, somewhat smaller and saccular, began just below the arch. This one contained the gold wire introduced surgically, with an antemortem thrombus between the wire filaments. The thrombus was adherent to the wall of the aneurysm and in places was definitely laminated. The laminated portion undoubtedly had been present before the operation. The posterior wall of the aneurysm had eroded into the dorsal vertebrae for a distance of about 1.5 cm. There was no evidence of hemorrhage or infection around the operative site. The heart was normal in size, since the syphilitic process had not extended down to the region of the aortic valve. The immediate cause of death was a very extensive, confluent bronchopneumonia of the right lung with numerous abscesses and bilateral acute fibrinous pleurisy.

Microscopic examination of the aorta showed all the characteristic findings of syphilis—lymphocytic infiltration around the vasa vasorum of the media and adventitia, and destruction of the elastica.

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THE TEN CHIEF CAUSES OF DEATH

We are all aware of the shift in recent years in the ten chief causes of death toward those that are natural accompaniments of old age, and the lengthening of the span of life that has been responsible for this—or rather has resulted from it. According to statements by well-recognized authorities, the country is almost in sight of the millennium of death by old age, and since animals live five times the number of years necessary for full growth of their skeletons, and man's skeleton takes twenty-one years to grow, the theoretical span of life should exceed the Biblical three score and ten by thirty-five years.

Six of the first ten causes of death in 1934 are already those in which age is a definite predisposing factor. Thus, in the entire registration area, heart disease, the foremost, with over 300,000 deaths yearly, more than doubles any other, and with a rate rising three times faster than its nearest competitor, cancer, is one of the principal diseases of age.

Cancer, the second cause of death, took 140,000 lives in 1934, a rise of 6,000 over 1933. At least part of this rise is indisputably due to the fact that more individuals are living to the cancer age. Considerable hope so far as the death rate from this disease is concerned may be found in a report from the American College of Surgeons that records 25,000 verified cures of cancer by surgery, x-ray and radium. Moreover, Memorial Hospital in New York reports its breast cancer cures rising from 46 to 87 per cent in sixteen years.

Nephritis, the third cause, was responsible for 106,000 deaths in 1934, an increase of about 5,500 for that year, and the fourth cause of death, cerebral hemorrhage, killed 97,000, with an increase of 7,000. It is not until we reach tuberculosis, in fifth place, with a death total of 71,000, that we find an infectious disease in the list of ten. Tuberculosis is also the only one of the ten whose death rate is decreasing.

Lobar pneumonia takes sixth place in 1934 with a death total of 54,000, 9,000 more than the preceding year. In the same years, bronchopneumonia, responsible for 41,000 and 37,000 deaths, respectively, takes seventh place. These two acute pulmonary infections represent an important problem that is being subjected to unremitting attack.

Premature births in eighth place with 35,000 deaths, an increase of 2,000, and diabetes in ninth place with 28,000 deaths, an increase of about 1,200, are both subject to considerable improvement in their death rates as scientific progress and public education continue.

Arterial disease in tenth place, with 27,000 deaths in 1934 and 25,000 in 1933, again brings age into the list as a predisposing factor.

This same general trend, with slight variations, is brought out for Massachusetts in Chadwick's masterly Shattuck Lecture, published in our issue of June 10. Here, for the years 1931-1935, heart disease also takes first place, with cancer following. Cerebral hemorrhage, however, is in third place instead of nephritis, and pneumonia, undifferentiated, in fourth place. Nephritis comes fifth, followed by accidents, tuberculosis and diseases of early infancy. As in the more inclusive statistics given above, diabetes and arteriosclerosis rank ninth and tenth.

Some of these causes of death are susceptible to tremendous revision when science finds the key that fits them; all are subject to steady improvement as knowledge is applied to them from various angles. Even if the millennium is not ultimately attained, we are making constant progress in its direction.

SCIENTIFIC JOURNALISM

Our esteemed Uncle Dudley, in the *Boston Globe,* has recently discoursed upon the general run of discoveries now being announced by the army of those who aspire and perspire under the banner of science. Unfortunately the scientist who succeeds without publishing his work is as rare as the merchant who succeeds without advertising his wares, and for the same reason, there can be no success without some degree of recognition. This recognition may be confined to a relatively small group of individuals who are capable of understanding the particular interests involved, or it may expand to the limits of popular acclamation. In general, the wider the audience that is sought for the exposition of a given theme the less inherent merit resides therein, although we have known authors who have sought wider and repeated publicity from the simple motive of "doing the most good." Regardless of whom is being "done good," it is a fact that the number of productive scientists has increased until, as Uncle Dudley says, the "brushwood begins to obscure the noble trees."

It is heartening to find that the editors of a daily paper suggest that one of their problems is the handling of news items from quasi scientists. One might have supposed that some of the dailies had welcomed the astounding cures they publish. As editors, one of our great problems—and we fancy Uncle Dudley's too—is to keep the "pot boilers" off the "front page."

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS AND GYNECOLOGY

M. Fletcher Eades, M.D., *Secretary,*
19 Bay State Road,
Boston

Case History No. 34. Bleeding at Five and One-Half Months

Mrs. J. B., a white woman, aged 32 years, was admitted to the hospital May 13, 1937. She complained of intermittent vaginal bleeding for three weeks. The flowing had been continuous for the past twenty-four hours during which time eight vaginal pads had been completely saturated. She had been treated by rest in bed and occasional hypodermic injections. When the bleeding became more profuse her physician referred her to the hospital.

There was no family history of tuberculosis, malignancy or hemorrhagic diseases. Her general health had been good except for measles and mumps in childhood and an occasional attack of tonsillitis. The tonsils and adenoids were removed at the age of twelve years. An attack of acute appendicitis at the age of sixteen years was treated by appendectomy, and the convalescence was uncomplicated. The menses started at the age of thirteen years and had always been regular and normal in amount. The last normal menstrual period began December 1, 1936, and life was first noted April 28, 1937. There had been two full-term pregnancies without complications, in 1933 and 1935. Both deliveries were normal, and the children are living and well.

On physical examination the patient was thin, and there was definite pallor of the skin and mucous membranes. The eyes, ears, nose and throat were normal. Several upper and lower teeth were missing with many others carious. There was no enlargement of the cervical lymph nodes, and the thyroid gland was prominent but symmetrical. Chest expansion was equal, and the thorax symmetrical. The lungs were resonant to percussion, and the breath sounds normal. The heart sounds were regular, and there were no murmurs. The breasts were slightly pendulous, and colostrum was easily expressed. The abdomen was soft, and there was a soft symmetrical tumor in the lower midline of the abdomen which reached to the level of the umbilicus. No fetal parts could be made out, and the fetal heart was not audible. The axillary and inguinal lymph nodes were not palpable. The extremities were normal in appearance, and the knee jerks equal and active. A vaginal pad which had been in place for one-half hour was removed and found to be completely saturated. A slight trickle of fresh bright blood was coming from the vagina.

The temperature was 98.6°F., the pulse 88 per minute, and the respirations 20. The blood pressure was 110 systolic and 80 diastolic. Examination of the blood showed: red blood cells, 3,200,000; white blood cells, 8,200, and hemoglobin (Sahli) 64 per cent. The Hinton blood reaction was negative, and urinalysis from a catheter specimen was essentially negative.

The patient was placed on conservative treatment in the hospital for four days. The flow lessened in amount but continued to be bright red in color. She did not complain of cramps or abdominal pain at any time. Because of the persistent bleeding a sterile vaginal examination un-

A series of selected case histories by members of the section will be published weekly.
Comments and questions by subscribers are solicited and will be discussed by members of the section.

der nitrous oxide-oxygen anesthesia was performed. Examination with the speculum showed a roughened multiparous cervix with small old bilateral lacerations. There was a continuous flow of bright blood from the external cervical os, evidently coming from within the uterus. The perineum was moderately relaxed, the cervix soft, and the uterus symmetrical and of a size consistent with five months' gestation. On gently inserting the index finger through the internal os, the bleeding increased, and placental tissue was felt entirely covering the lower uterine segment on all sides. The membranes were ruptured with a hysterectomy clamp, and a No. 3 Voorhees bag was inserted, filled with sterile water, and a 1-pound weight attached. The bleeding stopped immediately, and the patient's condition improved markedly. Two previously tested compatible donors were kept available. In three hours contractions began, and in eight hours the Voorhees bag was expelled followed by the extrusion of the fetus. The placenta had been perforated and was obviously of the central variety.

The uterus reacted well; the patient was pale but apparently in good condition. The pulse was regular, 120 per minute; the systolic blood pressure was 80, and the diastolic 50. Because of the secondary anemia and previous loss of blood a transfusion of 500 cc. of citrated blood was administered. The patient's response to the transfusion was immediate, and one hour after delivery the pulse had diminished to 92 per minute, and the blood pressure had increased to 118 systolic and 72 diastolic.

The description of the specimen was as follows: "The specimen consists of a normal five-month embryo in an amniotic sac which has been perforated through the placental area. The placenta is thin and irregularly discoid in outline. The cotyledons show evidence of attachment except in the central portion, which has been perforated. Here there is a large conical-shaped cotyledon which is partially torn away by trauma. There are some old fibrin and blood clots about this area."

The patient remained in the hospital for twelve days. Her convalescence was uneventful and afebrile after two days. Blood studies on discharge showed a moderate secondary anemia for which ferrous sulfate was prescribed.

Comment. Placenta previa, while it usually does not cause bleeding until the last trimester of pregnancy, may produce this symptom earlier and cause either persistent or intermittent hemorrhage of varying degree. In this case, bleeding persisted almost four weeks before the condition was diagnosed. Vaginal bleeding over this period without either abdominal pain or cramps was significant. The continued exsanguination was the issue which forced a more complete investigation of the cause. Once the diagnosis was made, there was no reasonable hope that the pregnancy could continue to full term without endangering the mother. Due to the small dilatation of the cervix, the small Voorhees bag seemed to offer the most conservative means of both controlling the hemorrhage and initiating labor. The use of blood transfusion in this type of case not only improves the immediate postoperative reaction but probably increases resistance against infection and shortens the convalescence.

VERMONT STATE MEDICAL SOCIETY

FOURTH ANNUAL CLINICAL MEETING

The fourth annual clinical meeting of the Vermont State Medical Society was held at the Mary Fletcher Hospital, Burlington, on May 7 and 8, 1937. As in the past, the program of this meeting was presented by members of the faculty of the University of Vermont College of Medicine. Approximately 140 physicians attended the sessions, which were held in the surgical amphitheater, classrooms and laboratories of the hospital. A complimentary luncheon was served to all guests at the hospital on Friday and an informal dinner was given at the Ethan Allen Club on Friday evening. Entertainment during and following the dinner was provided by the Mary Fletcher Hospital interns' quartet, and several one-act plays were presented by members of the Burlington Theater Club.

The committee in charge of the meeting consisted of Dr. W. T. Rees, chairman, Dr. P. K. French and Dr. E. D. McSweeney. The meeting was entirely clinical and consisted of case discussions and demonstrations.

The Friday morning session was opened with a discussion of urinary calculi led by Dr. W. G. Townsend. The etiology, symptomatology, diagnosis and management of this condition were discussed and several illustrative cases were shown. "The Use of New Insulin Products" was next presented by Drs. P. K. French and H. E. Upton. Charts demonstrating the different features of each were exhibited, and the general management of diabetes with especial reference to insulin and protamine insulin was discussed. Drs. W. T. Rees and A. G. Mackay of the surgery department and Dr. A. B. Soule, Jr., of the radiology department led the next symposium on "Cancer of the Breast." Etiology, classification and management from the surgical and radiologic viewpoints were the principal features presented. Drs. E. J. Rogers and L. A. Rabinowitz of the department of tuberculosis demonstrated the use of intrapleural pneumolysis and showed x-ray films of a number of patients treated by them in the Vermont State Sanatorium. "The Diagnosis of Acute Pelvic Lesions During the Child-Bearing Period" was presented by Drs. P. E. McSweeney and E. D. McSweeney of the gynecology department. Gross specimens representing various gynecologic conditions were demonstrated.

During the noon hour, group conferences were held in various portions of the hospital. Drs. O. N. Eastman and H. A. Durfee of the obstetrics department demonstrated forceps application on the manikin; Dr. A. B. Soule, Jr., conducted a conference on radiotherapy of cancer of the

breast; and Dr. E. H. Buttles showed various laboratory examinations.

Round-table conferences were held during the afternoon by the departments of surgery, medicine and pediatrics. The surgery seminar discussed the diagnosis and management of various intra-abdominal lesions. Dr. Lyman Allen, professor of surgery, was chairman of this section. With Dr. C. H. Beecher, professor of medicine, presiding, the medicine seminar discussed a variety of subjects, including prontylin and prontosil, migraine, electrocardiography, liver function tests and syphilis. The pediatrics seminar with Dr. C. K. Johnson, professor of pediatrics, presiding, discussed management and diet during the first year.

The last session of the afternoon was held at the Fleming Museum where two motion picture films were presented—"Normal Delivery in the Home," prepared by the obstetrics department under the direction of Dr. H. A. Durfee, and "Appendicitis," prepared by Dr. W. T. Rees of the surgery department.

The Saturday morning session was opened with a discussion of local anesthesia by Dr. K. F. Truax, who outlined the principles involved and methods used. Closed system anesthesia was then discussed by Dr. A. G. Mackay, and the apparatus for administering the anesthetic agents was demonstrated. The departments of medicine and pathology collaborated in presentation of a group of patients with various blood diseases. The conditions demonstrated were: chronic myelogenous leukemia, chronic lymphatic leukemia, acute leukemia, Banti's disease, thrombocytopenic purpura, hemophilia, pernicious anemia and severe hypochromic anemia. The diagnosis and management were presented by Drs. C. H. Beecher and E. L. Amidon and the hematology and pathology by Drs. E. H. Buttles and Richard Fuller. Dr. R. L. Maynard, assistant professor of orthopedic surgery, demonstrated a number of cases of osteochondritis and several bone tumors. The immediate repair of lacerations was the subject of a chalk-talk by Dr. H. A. Durfee, and a demonstration prenatal visit was conducted by Dr. O. N. Eastman and Miss Eleanor Hoag, R.N.

VERMONT DEPARTMENT OF PUBLIC HEALTH

June, 1937

The following communicable diseases were reported to the office of the Department of Public Health during the month of June: measles 15; German measles 25; whooping cough 45; diphtheria 3; typhoid fever 1; mumps 226; scarlet fever 10; chickenpox 52 and undulant fever 5.

The Laboratory of Hygiene made 2,329 examinations, the details of which are:

Examinations	for	diphtheria bacilli 95
"	"	Widal reaction of typhoid fever... 61
"	"	undulant fever 125
"	"	gonococci in pus..... 160
"	"	tubercle bacilli 269
"	"	syphilis 848
"	of	water, chemical and bacteriologic.. 240
"	"	milk, market 155
"	"	milk, submitted for chemical only. 5
"	"	milk, submitted for microscopic only 5
"	"	foods 12
"	"	drugs 0
"	for	courts, autopsies 3
"	"	courts, miscellaneous 22
Autopsies to complete death returns.....		2
Miscellaneous examinations		78

The director of the Division of Venereal Diseases reports 44 cases of gonorrhea and 56 cases of syphilis; 487 Wassermann outfits and 298 slides were distributed during the month.

During the month of June the Crippled Children's Division had 3 patients at the Audubon Hospital in Boston, 6 at the Children's Hospital, 3 at the Rutland Hospital and 1 at the Mary Fletcher Hospital. The Camp for Crippled Children at Goshen opened this month, and arrangements for 42 crippled children were made through this division to attend for the month of July.

Under the Public Health Nursing Division, considerable time has been given to toxoid clinics. A conference of all the maternal and child-health nurses was held June 9. Dental programs have been arranged for three towns, and talks have been given in several towns.

July, 1937

The following communicable diseases were reported to the office of the Department of Public Health during the month of July: whooping cough 79; measles 17; chickenpox 32; mumps 149; diphtheria 4; scarlet fever 8; poliomyelitis 2; and undulant fever 5.

The Laboratory of Hygiene made 2,420 examinations, the details of which are:

Examinations	for	diphtheria bacilli 133
"	"	Widal reaction of typhoid fever.. 61
"	"	undulant fever 122
"	"	gonococci in pus..... 135
"	"	tubercle bacilli 180
"	"	syphilis 924
"	of	water, chemical and bacteriologic. 282
"	"	water, bacteriologic 248
"	"	milk, market 188
"	"	milk, submitted for chemical only. 0
"	"	milk, submitted for microscopic only 7
"	"	foods 7
"	"	drugs 0
"	for	courts, autopsies 2
"	"	courts, miscellaneous 22
Autopsies to complete death returns.....		1
Miscellaneous examinations		108

The director of the Division of Venereal Diseases reports 40 cases of gonorrhea and 70 cases of syphilis. Five hundred and seventy-three Wassermann outfits and 243 slides for gonorrhea diagnosis were distributed from the division.

The director of the Crippled Children's Division reports 183 patients seen during the month and a total of 224 visits made. Eleven patients were admitted to hospitals during the month and 9 were discharged. Fifteen pieces of apparatus were fitted during the month, 5 pieces were altered and repaired and 22 orthopedic corrections were made to shoes. The vocational worker reports 33 home visits, and sales for the month of $86.74.

The sanitary engineer has given considerable time to the inspection service which was authorized under Act 133 of the Acts of 1937, and reports a total of 1,078 places inspected for the first three weeks of July. Besides the usual calls on matters of sewage, water supplies, school houses, and so forth, 29 boys' and girls' camps were inspected.

The Division of Public Health Nursing reports a new health center at Newfane. Two infant and preschool medical conferences were held during the month and several tonsil clinics, in different sections of the State. The

director of the Maternal and Child Health Division attended eight preschool clinics. A dental program has been laid out in Vergennes, and much interest has been shown concerning a similar program in Brattleboro. Five hundred and fifty notifications of birth registration, 150 diphtheria consent cards and 294 baby booklets were sent out during July.

CORRESPONDENCE

TREATMENT OF GONORRHEA AND SYPHILIS

To the Editor: The attention of the medical profession and hospital superintendents is called to the appended regulations which the Department of Public Health has promulgated under the authority of the General Laws, chapter 111, section 117, as amended by the Acts of 1937. The act itself is as follows:

> "For the purpose of providing treatment for persons suffering from gonorrhea or syphilis, and who are unable to pay for private medical care, the department shall, or with the co-operation of local boards of health, hospitals, dispensaries or other agencies may, establish and maintain clinics in such parts of the commonwealth as it may deem most advantageous to the public health, and may otherwise provide treatment for such diseases subject to such rules and regulations as the department may from time to time establish. Cities and towns, separately or jointly through their boards of health or municipal hospitals, may establish and maintain such clinics. For the purposes of this section, providing treatment shall include providing transportation or the reasonable cost of such transportation to and from the place where treatment is given whenever the patient is not able to pay for such transportation."

This act and these regulations are an outcome of the report of the Special Commission to Study and Investigate Public Health Laws and Policies, and they are designed to make possible the treatment of gonorrhea and syphilis in those who are unable to pay for private medical care, without their identification to local boards of health and welfare.

GAYLORD W. ANDERSON, M.D.,
Deputy Commissioner of Public Health.
Massachusetts Department of Public Health,
State House, Boston.

THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC HEALTH, 545 STATE HOUSE, BOSTON

REGULATIONS

FOR THE PROVISION OF TREATMENT FOR PERSONS SUFFERING FROM GONORRHEA AND SYPHILIS AND WHO ARE UNABLE TO PAY FOR PRIVATE MEDICAL CARE, AS PROVIDED BY THE GENERAL LAWS, CHAPTER 111, SECTION 117, AS AMENDED.

Effective August 26, 1937

CO-OPERATING CLINICS

DESIGNATION AS A CO-OPERATING CLINIC

1. Application for designation as a co-operating clinic shall be made in writing to the Massachusetts Department of Public Health by the superintendent or director of the institution or agency which maintains and operates the clinic, or, for local board of health or health-department clinics, by the local board of health or health commissioner.
2. The Department reserves the right to accept or reject any application for designation as a co-operating clinic, or to revoke such designation for cause, and after a hearing.
3. No clinic will be designated as a co-operating clinic which is not maintained and operated by an incorporated charitable organization and which is not located upon premises used predominantly for the purposes of the said incorporated charitable organization, except that any clinic maintained by a municipal hospital or a local board of health or health department, or any state institution, may be so designated.
4. No clinic will be designated as a co-operating clinic which is maintained by a general hospital whose charter or by-laws discriminate against the admission to the hospital of any person because of infection with gonorrhea or syphilis or whose trustees or superintendent so discriminate.

DUTIES OF A CO-OPERATING CLINIC

5. A co-operating clinic shall register with the Department, on forms provided for that purpose, every patient with gonorrhea or syphilis, and every contact, who visits the clinic subsequent to its designation as a co-operating clinic. A contact, within the meaning of these regulations, is any person who may have been exposed to, or who may have been the source of, an infection with gonorrhea or syphilis, and who is under observation at the clinic because of the possibility of infection.
6. A co-operating clinic shall submit visit vouchers for each visit of every patient and every contact registered with the Department, on forms provided by the Department for that purpose. The visit vouchers, properly executed, shall be forwarded to the Department within twenty-four hours after the end of each clinic day, excluding Sundays and holidays.
7. A co-operating clinic shall submit bills, in duplicate, promptly at the end of each calendar month, on forms provided by the Department for that purpose.
8. A co-operating clinic shall permit authorized representatives of the Department to examine the clinic record of any patient or contact at any reasonable time.
9. A co-operating clinic shall dispense any ordinary drugs or appliances necessary to the treatment of gonorrhea or syphilis to any patient who cannot afford to purchase the prescribed drugs or appliances.
10. A co-operating clinic shall provide the cost of transportation to the patient or contact for those who cannot afford necessary transportation to and from the clinic.

REIMBURSEMENT OF CLINICS

11. Only co-operating clinics will be reimbursed for the treatment of gonorrhea or syphilis, or the observation of contacts.
12. Reimbursement will be made on a per visit basis for each visit of each patient or contact for whom visit vouchers have been submitted to and approved by the Department, at rates to be fixed by the Department from time to time, and subject to the following qualifications.

    a. If any patient or contact can pay any part of the clinic's established fee, he or she shall be required to do so, and reimbursement by the Commonwealth shall then be equivalent to the difference between the fee paid by the patient or contact, and the current reimbursement fee; except that if the fee paid by the patient or contact exceeds the current reimbursement fee, there shall be no reimbursement by the Commonwealth for that visit.

b. Reimbursement will be made for only those visits by contacts which are necessary to determine whether or not the contact is infected, but in no case for longer than two months after the date of admission to the clinic if there was exposure to gonorrhea, or three months after the date of admission to the clinic if there was exposure to syphilis.

13. Reimbursement will also be made for such sums paid by the clinic to patients or contacts for necessary transportation to and from the clinic and which the patient or contact cannot afford to pay; provided that the cheapest form of reasonable transportation be used, unless an acute emergency requires the use of more expensive conveyance. The cost of transportation may be provided, subject to reimbursement, only from the point from which the patient comes directly to the clinic and to the point to which the patient must go directly from the clinic, but in no case shall the cost exceed that of transportation to or from the patient's or contact's place of residence or employment. Costs of transportation will not be subject to reimbursement by the Commonwealth, except for reasons acceptable in each case to the Commissioner of Public Health, if the patient or contact attends any other co-operating clinic than the one to and from which transportation costs are the minimum. The amounts paid to any patient or contact for transportation costs shall be stated upon the corresponding visit voucher.
14. Further reimbursement will be made for any reasonable operating expenses in excess of the total fees collected from registered patients, contacts, and the Commonwealth, for each year ending November 30; except that such reimbursement will be made for the fiscal year of 1937 only for the period from September 1 to November 30, inclusive.
15. Annual statements of actual operating expenses shall be submitted to the Department promptly after November 30 of each year by the local boards of health or local health commissioners, for co-operating clinics maintained and operated by local boards of health or health departments. If reimbursement for visits has been in excess of the annual operating expenses, the excess in reimbursement shall be applied as reimbursement for visits in the next ensuing year, to the amount of the excess.
16. The rate of reimbursement is hereby fixed as seventy-five cents (75c) per visit.

Hospitals

17. Any municipal hospital, or any general hospital incorporated as a charitable agency, may apply for reimbursement for the treatment of a patient for gonorrhea or syphilis who cannot afford to pay for hospital care. The application must be made in writing immediately upon the admission of the patient or as soon thereafter as the diagnosis can be established, and shall state the case number of the patient, the diagnosis, and the particular circumstances which make hospitalization necessary, and it shall be signed by the superintendent of the hospital.
18. The applying hospital will be reimbursed, at rates to be fixed by the Department from time to time, subject to the following qualifications:—

a. For the treatment of only those patients who, in the opinion of the Commissioner of Public Health, after review of the application, are in need of hospital care because of active infection with gonorrhea or syphilis.

b. For only such hospital care as may be provided after the diagnosis has been made and because of active infection with gonorrhea or syphilis, but in no case shall reimbursement be made for expenses incurred prior to the five days next before the application for reimbursement is received by the Department.

c. If the patient or the patient's parents or guardian can pay any part of the hospital fee, he, she, or they shall be required to do so, and reimbursement by the Commonwealth will be made for the difference between the fee so paid and the total hospital bill; except that the amount of reimbursement shall in no case be at a per diem rate in excess of the current reimbursement rate as fixed by the Department.

d. No application for reimbursement will be approved by the Department which is submitted by any hospital whose charter or by-laws discriminate against the admission of any person because of infection with gonorrhea or syphilis or whose trustees or superintendent so discriminate.

19. Bills shall be submitted to the Department in duplicate, at the end of each calendar month upon forms which will be forwarded to the hospital upon approval of the application for reimbursement.
20. The per diem rate of reimbursement is hereby established at three dollars and fifty cents ($3.50), which shall constitute reimbursement in full for all services rendered the patient.
21. Authorized representatives of the Department shall be permitted to examine at any reasonable time the hospital record of any patient for whose care reimbursement is requested.

Physicians

22. Application may be made by any physician licensed to practice medicine within the Commonwealth of Massachusetts for reimbursement for the treatment of any patient with gonorrhea or syphilis who cannot pay for private medical care, if, for economic or other reasons acceptable to the Commissioner of Public Health, the patient cannot reasonably attend any one of the co-operating clinics.
23. The application shall state the patient's case number (or initials), the city or town of residence, the diagnosis, the reasons for the patient's inability to attend a co-operating clinic, and an outline of the proposed plan of treatment.
24. Upon approval of the application by the Commissioner of Public Health the physician shall register the patient with the Department upon forms which will be provided for that purpose, and shall, thereafter, submit vouchers for every visit made by the patient so long as treatment for gonorrhea or syphilis is continued by said physician.
25. The physician shall notify the Department promptly upon the failure of the patient to continue treatment regularly and shall accept the services of the Department's confidential follow-up service for the follow-up of the unco-operative patient and for such epidemiologic investigation as may be necessary. Failure to accept such service will be grounds for withholding reimbursement.
26. Reimbursement will be made at rates to be fixed by the Department from time to time, for each visit for which a visit voucher has been submitted to and approved by the Department, subject to the following qualifications:—if any patient can pay any part of the physician's fee for any visit, he or she shall be required to do so, and reimbursement by the Commonwealth shall then be made for the difference

between the fee paid by the patient and the current reimbursement fee, except that if the fee paid by the patient exceeds the current reimbursement fee, there shall be no reimbursement.

27. Bills must be submitted in duplicate promptly at the end of each calendar month on forms provided by the Department for that purpose.
28. The rate of reimbursement is hereby fixed at two dollars ($2.00) per visit which shall constitute reimbursement in full for all services rendered the patient.
29. Authorized representatives of the Department shall be permitted to check any bill submitted against the patient's record at any reasonable time.

HENRY D. CHADWICK, M.D.,
Commissioner of Public Health.

THE CHETWOOD CHEST

To the Editor: The following, communicated to me by a member of the family mentioned, is a curious account of coma mistaken for death.

Peter Bulkeley, one of the "seers" of Concord, Mass., married Lady Chetwood in England in 1635. Shortly afterward they sailed for America taking with them a very large, carved linen-chest. During the voyage Peter's wife apparently died, but not quite sure himself and to keep the fact from the sailors, he bored holes in the chest and put her into it. She was only in a coma, came to life and subsequently raised a large family of children.

The chest is now in the possession of Mrs. Morgan Bulkeley of Hartford, Conn.

CHARLOTTE O. COUES
(Mrs. Robert W. Coues).

3 Acacia Street, Cambridge.

CONTROL OF SYPHILIS

To the Editor: For the first time in the history of medicine, one of the worst, most pugnacious, insidious, destructive, and devastating of diseases—syphilis—has finally—against prudery, weak-minded leaders and obstinate and pernicious, unsound opposition—been brought out into the open, where it belongs, to be fought with scientific methods, which have helped and will help to eradicate this monster which has killed and maimed millions in this country.

Health departments have done some excellent work in the past, but we must not forget that the rank and file of the medical profession have done and are doing the fundamental work. The physicians needed encouragement—they have it now.

I should like to offer some constructive criticism. From what I have seen and heard, it seems that the health departments are trying to do this work by themselves, and perhaps employing a few leading men to take charge of new clinics to carry on the work in this "Drive on Syphilis." This is fairly good, but how will the general practitioners, who will carry the burden for the groundwork and lay the foundation by advising their patients and the general public to submit for blood examinations and to co-operate with the treatments, if necessary, be assured of some compensation for their efforts? Is this legitimate practice also to be taken away from them?

According to views expressed, when patients show positive bloods, the clinics should take care of them. The general practitioners and syphilologists, it is said, will go out of business for they charge too much, and people can pay only $2.00 for an arsphenamine injection. The above utterance apparently came from an individual who is of the opinion that the entire population at the present time is on public welfare rolls. Of course this is not so; perhaps one fifth are. Where are his feelings, common decency, and respect for the rest of the profession? Medical men cannot devote all their time at clinics gratis.

The National government has made an appropriation of $8,000,000 for combating syphilis; this is to be distributed among the states and territories, larger contributions going to Southern states where it is most needed. For a beginning the sum of $8,000,000 may be all right, but those who brought this about should explain to Congress that this amount must be increased to $100,000,000. The government is in a spending mood, even though in debt. What greater purpose could money be expended for than for eradicating syphilis? This can be done. If Norway, Sweden, and Denmark can eliminate syphilis almost entirely, we can do so in this country. To bring this about, every physician in this vast country must take a hand. He must be encouraged in some small way with those who cannot afford to pay even $5.00 per arsphenamine treatment, and those who can afford to pay regular fees should not be interfered with. These treatments require expert care, judgment and attention, and like laborers, physicians are entitled to their fee for services. This appropriation should receive 100 per cent value, for we are dealing with life and not with building materials or commodities. The health departments cannot carry on this work alone. They must have the co-operation of every physician in the State and Nation. As physicians must earn a living to support their families, they cannot be asked to give their time gratis to clinics.

Massachusetts can well afford to appropriate a few millions to carry on this work, for expenditures for the care of the insane and feeble-minded at hospitals will be definitely reduced by more than the amount of the appropriation.

Another matter of great importance is the question of marriage. We know that syphilis is frequently transmitted to offsprings. Many of these never come to term, many are stillborn, many die shortly after birth, and those who survive suffer and spread the disease. We are now beyond the point of jollying or kidding ourselves. This transmission of syphilis to innocent individuals must be stopped at once. It can easily be done by requiring a health certificate from each of the parties to marriage showing that a Wassermann, Kline or Hinton test had been done ten days prior to filing of marriage intentions. Certain states have required such certification for some time. We in Massachusetts who have always been leaders in this country in progressive legislation cannot help but feel ashamed at our backwardness in overlooking an opportunity to prevent syphilis at one of its modes of inception. I have prepared a draft for a bill for the legislature, which I am turning over to our Committee on State and National Legislation.

The medical profession can accomplish results with syphilis as it has with smallpox, diphtheria, typhoid fever, typhus, malaria, yellow fever, tetanus, cholera, and so forth. However, the State and National health departments must give reasonable and appropriate consideration to the men and women in general practice on this drive.

It is essential that every physician take the necessary blood for test of every patient he sees, whether they can pay for this service or not, and assist in every way he can in one of the greatest medical battles of all times—the destruction of arch enemy No. 1—syphilis.

H. M. LANDESMAN, M.D.

424 Marlborough Street,
Boston, Mass.

RECENT DEATH

WRIGHT—WILLARD L. WRIGHT, M.D., of 82 Beacon Street, Chestnut Hill, died at his home August 18. Dr. Wright was in his forty-ninth year.

Born in Keene, New Hampshire, August 27, 1888, he attended the schools of that city. He studied at Dartmouth College for two years, transferred to the Columbia University Medical School where he spent another year and graduated from the Tufts College Medical School in 1914.

After an internship at the Springfield Hospital he became assistant surgeon at the Boston Dispensary in 1917 and surgeon in 1923. During the War he served as first lieutenant in the medical corps at Camp Meade, Md.

Dr. Wright was a member of various Masonic bodies, the Commonwealth Golf Club and the Phi Gamma Delta fraternity. He had been a fellow of the Massachusetts Medical Society since 1916.

His widow, his mother, and two sisters survive him.

REPORT OF MEETING

HARVARD MEDICAL SOCIETY

The final meeting of the Harvard Medical Society for the current year was held at the Peter Bent Brigham Hospital on April 27, Dr. William Salter presiding.

Dr. Milton R. Weed presented the medical case. The patient, a 73-year-old, Italian-born housewife, entered complaining of substernal pain, shortness of breath, and swelling of the ankles of two months' duration. She had experienced recurrent attacks of right upper quadrant pain for twenty-nine years, which were unrelieved by a cholecystectomy performed nine years previously. A slight degree of ankle edema was noted at the time of this operation, and an attempt was made to digitalize the patient, but she refused medication. During the past ten years she had been unable to climb stairs because of orthopnea, and for the past two months she had been unable to walk because of the extreme degree of swelling of the legs. Four weeks before entry she suffered an attack of chills, fever and upper abdominal pain. Steadily deepening cyanosis appeared. Physical examination at entry revealed cyanosis of the arms, hands and lips, marked enlargement of the heart and signs of congestive failure. There was extreme edema of the legs, the skin of which was fissured, reddened and oozing purulent fluid. The total protein was 4.9 gm. per 100 cc. of blood. Phlebotomy was performed, with some relief of orthopnea and edema, and 1,350 cc. of fluid was removed by thoracentesis. Dr. Marshall N. Fulton remarked that the extreme brawny edema of the lower legs was probably due to cardiac failure, although the low total protein might be of some etiologic importance.

The surgical case was presented by Dr. R. T. Munce. A 50-year-old woman had been well until two years ago, when she experienced the onset of dizzy spells, which at first occurred once a week and lasted one to three minutes. These increased in frequency and severity until she experienced three to five attacks each week, each lasting three to five minutes. During the attacks she was unable to speak or to understand. One week before entry she lost consciousness while trying to climb a flight of stairs and was taken to the Boston Psychopathic Hospital. The blood sugar at the time of her entry to that hospital was 35 mg. per cent, and intravenous injection of glucose immediately restored consciousness. Repeated fasting blood-sugar analyses showed levels ranging from 35 to 65 mg. per cent. When her noon meal was omitted she suffered a reaction and mild coma at three o'clock in the afternoon. Injection of 1 cc. of adrenalin relieved symptoms in twenty minutes. Glucose, orally or intravenously administered, abruptly terminated attacks. At the time of entry to the Peter Bent Brigham Hospital the physical examination was negative except for emaciation and slight pitting edema of the ankles. Laboratory studies were essentially negative except for a markedly abnormal blood-sugar curve, which fell to a low level of 35 mg. per cent four or five hours after ingestion of food. A gastrointestinal series showed a duodenal ulcer. A diagnosis of pancreatic-islet adenoma was made, and the question of malignant degeneration was raised because of the emaciation of the patient. During the discussion it was remarked that severe liver disease or pituitary abnormality might cause a somewhat similar syndrome. An exploratory laparotomy was planned.

Dr. Milan A. Logan delivered the first paper of the evening, on "The Calcium Salts of Bone." If the phosphate concentration of a serum is known, he said, it is possible to determine whether or not bone salts will be precipitated. From a slightly acid solution large regular crystals of $CaHPO_4$ are precipitated which have a typical x-ray spectrum different from that of salts precipitated from neutral or slightly alkaline solutions. $Ca_3(PO_4)_2$ is precipitated from the latter solutions, although the exact composition of the salt depends upon the condition of the bone upon which it is precipitated. If carbon dioxide is present a substance of the formula $(Ca_3(PO_4)_2)_8CaCO_3$ is formed. The salts of bone are approximately of this composition. The carbonate concentration of young bone is lower than that of adult bone, however, and magnesium and other salts, which must be taken into account, are present. Dr. Logan has carried on investigations into the exact manner in which bone salts are formed, and has concluded that they are deposited in more than one step. During their precipitation calcium and carbonate ions are removed from the solution, even though the ion product of the two is below that normally essential for such precipitation. The ion product progressively decreases with progress in deposition. The loss of phosphate from the solution is dependent on the calcium ion concentration.

The uptake of carbon dioxide by the precipitate was found to be independent of the precipitation of phosphorus; when the precipitate was dissolved, the carbon dioxide could be removed independently of the phosphate, some 50 per cent of the former being removed with a loss of only 9 per cent of the latter. This indicates that calcium carbonate is held in the precipitate in a form different from that in which calcium phosphate is held.

At equilibrium the precipitate appears to be a mixture of three substances, but in reality it is one substance. The calcium and phosphate ion product required to form the precipitate must be higher than that prevailing at equilibrium. As the precipitate is decreased, the solubility product is increased.

Such findings indicate that bone does not form in the body unless the ions in the blood are increased, and that it will not dissolve unless the ions in the surrounding fluid are decreased. Therefore bone does not form spontaneously from blood plasma, but only after the cells at the site of deposition increase the ion concentration by one of several processes. During the growth of bone, absorption and deposition go on simultaneously, the cells in one area decreasing the concentration of ions and causing absorption while near-by cells are increasing the concentration of ions and causing deposition. Bone salts are definitely crystalline, and are not so complicated as was formerly believed.

The second paper of the evening was presented by Dr.

A. Baird Hastings, Hamilton Kuhn Professor of Biological Chemistry, Harvard Medical School, the subject being "Salt and Water Exchange between Tissues and Body Fluids." Dr. Hastings described experiments performed on cases of nutritional edema which were maintained on a constant diet and given sodium bicarbonate or ammonium chloride in doses sufficient to cause alkalosis or acidosis, as the case might be. Administration of sodium bicarbonate caused an immediate and marked retention of water, which was followed by a similar period of steadily decreasing retention and a loss of water. Discontinuance of the salt caused a water loss. Ammonium chloride caused a water loss at first which was followed by a period of water retention. These results led to the study of the effect of the pH on the distribution of water and electrolytes in tissues. Sodium, potassium, hydrogen, chloride and bicarbonate ions are distributed according to the Gibbs-Donnan law in serum and edema fluids. When dead muscle is equilibrated with serum, equilibrium between cations and anions is established, but when muscle is alive and fully supplied with oxygen, there is no equilibrium between the ions in the muscle and the blood serum.

The muscle cells are known to be impermeable to cations, and it now seems probable that they are also impermeable to chloride ions, and perhaps also to bicarbonate ions.

Although the water and electrolyte contents of tissues ordinarily vary greatly from animal to animal when based on weight of original tissue, the concentrations of ions were found to vary no more in muscle than in serum if the concentrations were based on fat-free tissue. If all the chloride present in muscle is in the extracellular phase, and if its concentration in this phase corresponds to that in edema fluid, not more than 17 per cent of muscle could be extracellular and not less than 83 per cent intracellular material. When chloride and sodium ions are added to muscle in vivo, there is no exchange between the cells and the surrounding fluid. If the salt solution added is isotonic and at pH 7.4, the fluid simply increases the volume of the extracellular phase without change in the intracellular phase. Experiments by Eichelberger and Hastings have shown that: (1) excessive overventilation with subsequent alkalosis causes a swelling of the cells; (2) acidosis due to excessive carbon dioxide causes a shrinkage of the cells with a loss of fluid from the tissues; (3) injections of isotonic solutions cause an increase in extracellular fluid, which, if a condition of alkalosis is created, will also be associated with a swelling of the cells; (4) hydrochloric acid and sodium chloride injections with the production of acidosis cause an increase in both the extracellular and intracellular phases.

When dehydration is experimentally produced by intravenous injections of hypertonic sucrose, or by intraperitoneal injections of isotonic glucose or hypertonic sodium chloride, the intracellular phase is decreased, but the extracellular phase may be either increased or decreased depending upon various factors. Various types of dehydration were discussed from the standpoint of the changes in salt and water in the tissues necessary to produce them. Six categories of dehydration were defined as follows:

(1) A decrease of extracellular fluid by transfer to the intracellular phase. This would follow the removal of salt from the tissues without the removal of water.

(2) A decrease of extracellular fluid both by loss from the tissue and transfer to the intracellular phase. This would result from removing a hypertonic solution from the tissue.

(3) A decrease of extracellular fluid by its removal from the tissue. This would occur from the removal of an isotonic solution.

(4) A decrease of extracellular fluid and a decrease of intracellular phase. This would follow the removal from the tissue of a hypotonic solution and would be most exaggerated by the removal of water alone.

(5) A decrease of intracellular phase with an increase of the extracellular fluid. This would occur when water was removed from and salt added to the tissue.

(6) A decrease of intracellular phase without loss of fluid from the tissue. This would follow the addition of salt alone.

Examples of the various types were given and their significance was discussed.

NOTICES

ANNOUNCEMENTS

WILFRED W. FORBES, M.D., announces the opening of an office at 61 Brook Street, Brookline.

LOUIS A. SIERACKI, M.D., announces the opening of his office at 71 Winter Street, Norwood, Mass.

WILLIAM B. STEVENS, M.D., announces the removal of of his office, September 1, to 320 Commonwealth Avenue, Boston.

ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES

The forty-fifth annual convention of the Association of Military Surgeons of the United States will be held October 14, 15 and 16 at the Ambassador Hotel, Los Angeles.

The first general meeting starts at 10:15 a.m., October 14; the invocation, addresses of welcome and responses will be followed by the president's address, delivered by Rear Admiral P. S. Rossiter, Surgeon General of the Navy. The first, second and third scientific meetings will begin at 1:30 p.m., October 14, and at 10:00 a.m. and 1:30 p.m., October 15, respectively. The second general meeting will start at 10:00 a.m., October 16; the guest speaker, Colonel Howard Naffziger, Med. Res., U. S. Army, will speak on "Surgical Treatment of Low Back Pain."

SOCIETY MEETINGS AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, AUGUST 30

WEDNESDAY, SEPTEMBER 1—

†12 m. Clinicopathological conference. Children's Hospital Amphitheater.

FRIDAY, SEPTEMBER 3—

12 m. Massachusetts General Hospital. Clinical meeting of the staff of the Children's Medical Service. Ether Dome.

SATURDAY, SEPTEMBER 4—

•10 a. m. - 12 m. Staff rounds at the Peter Bent Brigham Hospital. Conducted by Marshall N. Fulton.

•Open to the medical profession.
†Open to Fellows of the Massachusetts Medical Society.

SEPTEMBER 13-17—Fifth International Congress of Radiology. Page 709, issue of April 22, and page 233, issue of August 5.

SEPTEMBER 20-24—Sixteenth Annual Session of the American Congress of Physical Therapy. Page 288, issue of August 12.

SEPTEMBER 21, 22 and 23—Clinical Congress of the Connecticut State Medical Society, New Haven. Page 237, issue of August 5.

OCTOBER 1 and 2—New England Surgical Society. Providence, R. I.

OCTOBER 3-16—Medicomilitary Inactive Duty Training. Page 280, issue of August 12.

OCTOBER 5-8—American Public Health Association meeting. New York City.

OCTOBER 9—American Board of Ophthalmology, Chicago. Page 722, issue of April 22.

OCTOBER 14-16—Association of Military Surgeons of the United States. Page 379.

OCTOBER 19, 20, 21—Academy of Physical Medicine. Page 723, issue of April 22, and page 288, issue of August 12.

OCTOBER 25-29—American College of Surgeons. Chicago, Illinois.

NOVEMBER 1-12—1937 Graduate Fortnight of the New York Academy of Medicine. Page 1000, issue of June 3.

NOVEMBER 6—American Board of Obstetrics and Gynecology. Page 153, issue of July 22.

APRIL 4-8, 1938—The American College of Physicians. Page 41, issue of July 1.

JUNE 13 and 14, 1938—American Board of Obstetrics and Gynecology. Page 153, issue of July 22.

BOOKS RECEIVED FOR REVIEW

Maternal Care. The principles of antepartum, intrapartum, and postpartum care for the practitioner of obstetrics. Edited by F. L. Adair and others. 93 pp. Chicago: The University of Chicago Press, 1937. Paper bound, 25c; cloth bound, $1.00.

Condition Satisfactory. A physician's report of his own illness. Sandor Puder. 201 pp. New York and London: Alfred A. Knopf, 1937. $2.00.

Treatment by Diet. Clifford J. Barborka. 642 pp. Third edition, revised. Philadelphia, London and Montreal: J. B. Lippincott Company, 1937. $5.00.

Tumors of the Nervous System. An investigation of the most recent advances. Vol. xvi of a series of research publications. Published by the Association for Research in Nervous and Mental Disease. 493 pp. Baltimore: The Williams & Wilkins Company, 1937. $7.50.

The Harvey Lectures. Delivered under the auspices of the Harvey Society of New York. 1936-1937. Series xxxii. 245 pp. Baltimore: The Williams & Wilkins Company, 1937. $4.00.

Latent Syphilis and the Autonomic Nervous System. Griffith Evans. 158 pp. Second edition. Baltimore: William Wood and Company, 1937. $3.00.

Handbook of Hygiene. For students and practitioners of medicine. Joseph W. Bigger. 405 pp. Baltimore: William Wood and Company, 1937. $4.00.

Anatomy and Physiology of Physical Training. R. W. Galloway. 182 pp. Baltimore: William Wood and Company, 1937. $2.50.

The Cost of Adequate Medical Care. Samuel Bradbury. 86 pp. Chicago: The University of Chicago Press 1937. $1.00.

An Introduction to Dermatology. Richard L. Sutton and Richard L. Sutton, Jr. 666 pp. Third edition. St. Louis: The C. V. Mosby Company, 1937. $5.00.

Obstetric and Gynecologic Nursing. Frederick H. Falls. and Jane R. McLaughlin. 492 pp. St. Louis: The C. V. Mosby Company, 1937. $3.00.

BOOK REVIEW

Medical Greek and Latin at a Glance. Walter R. Agard. Second edition, revised. 87 pp. New York: Paul B. Hoeber, Inc., 1937. $1.50.

This book is a valiant and intelligent attempt to make up for the omission from premedical education of an adequate knowledge of Latin and Greek. Latin and Greek ought to be learned in one's youth, and their study continued throughout life if one wants any firsthand knowledge of the history of medicine in ancient times, or through the so-called Dark and Middle Ages. Some of the great contributions of the Renaissance, such as Harvey's *De Motu Cordis,* Vesalius's *Fabrica,* and Michael Servetus's *Pulmonary Circulation,* ought to be read in the original if one wants true knowledge of what the authors really said. In modern chemistry, including medical chemistry, and in modern medicine generally the Greek language has been drawn upon to an enormous extent for the necessary supply of new terms, for the reason cited in the author's preface, namely, "its extraordinary facility in forming compounds, a facility rivaled among languages only by the Arabic." These terms must be learned by brute memory, unaided by a knowledge of their original and usually illuminating meanings, unless one knows a little about the meaning of Greek and Latin prefixes and suffixes, and the nouns and verbs used by the Hippocratic writers and Galen, who dominated medicine for 1,500 years. One should also be able to read Latin translations, for by these they were first known, as Latin was the universal language of the learned world during the Middle Ages and the Renaissance. Who knows what the words, "crasis" and "temperament," meant, for instance, unless he knows the history of the doctrine of the humors? As the author says the book "makes no pretension to completeness, but presents a method by which short and intense study may give the student an intelligent comprehension of an increasingly large number of medical terms." It is hoped that the study of this book may lead to an increased study of medical history, which is of no small benefit to the knowledge of medicine both ancient and modern.

There is little to criticize in the English definitions of Greek and Latin terms. On page 31, the term "supraorbita" is defined as "above the wheel rut" or "eye socket." The "eye socket" was the result of the extension of the term "orbita" to mean a circle or the wheel itself. On page 65, the definition of the Greek term "phren" is given as "mind." The original meaning of "phren" was "diaphragm," as shown in the adjective form "phrenic nerve." It came to be called the "mind" through the unfortunate mistake of Aristotle, who regarded the heart as the center of sensation and motion, and the close association of the heart and diaphragm. "Phren" means the mind in such combinations as phrenzy or phrenology. On page 67, "salpingitis" is described as derived from "salpinx, a tube." Salpinx means a "trumpet," which is a close approximation to the real shape of the organ in question, while, as the author correctly states, "fistula" means a "pipe" or "tube." The Latin word "celum" is defined as a "cavity." This really is a Greek word, "koilon," hollow, and came in Latin to mean "the sky" or the vault of heaven, and should, I think, be printed "coelum" to show its origin. On page 79, Atlas is described as the hero who carried the world on his shoulders. Atlas should be ranked higher than a hero, for he was a god, and the father of the god, Hermes or Mercury. The definition of gangrene on page 83, as a "gnawing sore" from "grao, to gnaw," is correct, but in modern medicine it has come to mean rather the necrosis of the tissue surrounding either such a sore or necrosis of tissue from any cause. If one wanted to be captious, one might object to "Anguidae" defined as "snake" when it is a plural and really means the snake family, and the same applies to "Felidae," "cat," on page 83. However, these few inaccuracies make little difference to the value of the book as a whole. It ought to fill an important place in partially making up for the deficiencies of modern education and help to an intelligent understanding of many otherwise meaningless terms.